The Builder.

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Recent Discoveries in Rome.

THE Forum has not been of late the scene of striking discoveries, and the work of excavation is not being carried on upon so large a scale as it was a few years ago. The transformation of the monastery of S. Francesca Romana into a building which will contain the Forum museum and the necessary offices for the director is, however, progressing steadily, and when this work is completed, it will be possible to continue the exploration of the Basilica Æmilia.

In the meantime work is confined to the open area of the Forum. To the south-west of the base of the equestrian statue of Domitian remains of a structure of a later date than it have been discovered—a foundation of concrete, upon which rest fragments of a pavement of various coloured marbles and a layer of tiles, upon some of which are fragments of fine stucco decoration, belonging to the vaulted roof of a chamber of no very great size. Behind this are brick foundations; two rooms, which were originally paved with marble slabs, can be distinguished; the site of one of them was, in later days, occupied by the third (from the south-east) of the line of square brick bases which run parallel to the front of the Basilica Julia.

The identification with the imperial tribunal and the theory that this is the site upon which stood the well-known Trajanic reliefs, with views of the Forum upon one side and figures of animals for sacrifice upon the other, are, in the present state of the excavations, premature. The supposed representation upon one of these reliefs of the emperor seated upon the tribunal with a female figure approaching him is, more probably, a reproduction of a group of statues—the emperor being, perhaps, not Trajan (who is seen upon the rostra) but Nerva, who was the founder of the alimentary institutions which Trajan largely extended.

The examination of the arch of a drain of a somewhat curious shape (narrowing like a funnel), which was blocked up by the foundations of the Arch of Tiberius and by another drain following the line of the Vicus Iugarius, has shown that the shape is due to the fact that it was intended to receive the contents of two drains which joined at an acute angle. It contained fragments of pottery, coins of Augustus and Tiberius, etc.

The official reports continue to deal with the archaic necropolis to the south-east of the Temple of Faustina. The fourth report has just appeared, after an interval of more than a year (*Notizie degli Scavi*, 1905, 145-193). Of the five tombs described one alone presents a case of cremation, and it has been cut by two of the four later tombs, in all of which the body was buried unburnt. This report is fully illustrated, and forms a remarkably complete record of the discoveries made; but at least one, and perhaps two, more will be required before the publication even of that part of the cemetery which has been explored is complete. In the meantime, practically no reports on any other portion of the excavations have appeared since 1902 in the *Notizie*, so that we are without official information as to much of the work of several years back; and it is naturally difficult for writers who are not in possession of all the essential facts to form theories with regard to them without exposing themselves to the risk of being proved to be wrong (through no fault of theirs) when the official reports at length appear. The most important contribution to the literature of the Forum is a long article by Prof. Hülsen in *Römische Mitteilungen*, 1905, 1-119.

Turning to other parts of Rome, we may note that excavations for the opening of a new road have led to the discovery and almost simultaneous destruction of another portion of the huge necropolis which lay to the west of the Via Salaria. (*Not. Scav.*, 1905, 12 *sqq.*, 81 *sqq.*, 142 *sqq*, 200 *sqq.*; *Bull. Comunale*, 1905, 188 *sqq.*) In one of the tombs was found a terra-cotta plaque, with decorations in relief, still retaining the original colouring. It represents the stage of a Greek theatre with a scene from a tragedy being performed upon it.

A report also appears (*Not.*, 1905, 102 *sqq.*) of the recent discoveries in the catacomb of Commodilla, near the Church of S. Paolo fuori le Mura, on the Via Ostiensis. The catacomb was entered in 1720, but a landslip soon rendered it inaccessible once more, and it has only been explored during the last and the

present year. Interesting paintings of the VIth century have been found, representing the martyrs Felix, Adauctus, and Emerita, who were buried here. The inscriptions discovered belong to the IVth, Vth and VIth centuries.

The construction of an electric tramway to the Alban Hills has led to the discovery of remains of some importance. At the point where it crosses the line of the great aqueducts (near the so-called Porta Furba) the cutting was not carried deep enough for the discovery of the channel of the Anio Vetus; but in the course of excavations (to provide earth for an embankment) which were made some way further to the north, the road connected with the service of the aqueducts, and a *cippus*, or terminal stone, belonging to one group of them (the Marcia, Tepula, and Julia), and bearing the number 71, and an inscription recording its erection by Augustus, were discovered. The numbering began from Rome, and not from the springs.

A very fine mosaic pavement was discovered in making the foundations of the bridge by which the tramway crosses the railway to Naples. Only about one-third of it could be removed, as the rest lay under the main line. It is in black and white, with geometrical designs and groups of figures in octagonal panels (a drawing is given in *Not. Scav.*, 1905, 72). Further up the line, beyond the place where the tramway crosses the railway to Frascati, some 10 miles out of Rome, the high road, which the tramway has followed for some miles, ascends so steeply that the tramway takes, for two miles or so, a more devious course through the vineyards. In making this portion of the line the remains of several large villas, and especially of the enormous substructures of concrete upon which the villas themselves rested (the majority already in part visible), were laid bare and in part destroyed, but no discoveries of much importance were made. One obtained, however, a good idea of the massive construction of these buildings, and details of archæological interest could be noted.

An account of inscriptions previously discovered in this district is given by Professor Lanciani, in *Bull. Comunale*, 1905, 129 *sqq*. There was, between the seventh and twelfth miles of the Via Latina, an almost continuous line of habitations, and no less than four different centres are known to us—a village near the seventh mile, the name of which is not known; a post station at the tenth mile (Ad Decimum) at the point of junction of an important cross-road, the inhabitants of which were called Decimienses; a village immediately beyond, called the Vicus Angusculanus; and another at or near the twelfth mile, the name of which is also unknown.

Before Grottaferrata is reached a line diverges to Frascati, and beyond Grottaferrata is the junction for Albano in one direction and Rocca di Papa in another. The former line follows the high road, but the latter zigzags through the vineyards. Here, however, the discoveries have been few, only one large villa having been discovered rather less than a mile below Rocca di Papa; and, as the work is nearly finished, there is hardly any prospect of more.

REPAIRS AND DILAPIDATIONS.

THERE is not a more important subject in connexion with buildings than that of Repairs and Dilapidations, for it is one which constantly arises, not only in the relations of landlord and tenant, but of trustee and tenant for life, and very frequently also in regard to ecclesiastical buildings. Fresh cases arise from time to time, but as a rule they are illustrative of well-formed principles which in themselves are comparatively elementary. Any one who peruses Mr. Jackson's book, "Law of Repairs and Improvement, including Ecclesiastical Dilapidations,"* will see at once what an immense quantity of judicial decisions exist illustrative of general principles. The difficulty of the subject arises because it is filled with so much detail; that is to say, the application of a principle is overburdened, as it necessarily must be, with numerous examples.

Non-repair, the allowing of premises to deteriorate through wear and tear, is in law known by the name of "waste," and liability on the part of a tenant arises in respect of it either by express covenant or by an implied covenant arising out of the relationship of landlord and tenant. The object of the law is to hold an even balance between these two parties—on the one hand, that the premises of the landlord may be kept up to a reasonable standard, and on the other that the tenant shall not have an undue burden placed on him. Like most legal principles, this is one easy to understand in theory; when it is applied to concrete facts, numerous, and often very detailed, it is apt to be lost. This difficulty will be apparent to a reader of this useful work almost at any place where he may open it. Take, for example, this passage (p. 122):—"A tenant from year to year must keep the premises watertight." This is a plain sentence enough, but then the question arises, how much work is to be done in order that this legal duty may be fulfilled? Even the well-equipped author of this treatise has, after years of legal decisions, to answer it in a somewhat doubtful manner. "This does not," he says, "necessarily mean that he must replace broken glass by new panes, but possibly it would not be enough to keep the rain out by means of boards or tarpaulins: he certainly need not make substantial repairs, such as a new roof, but he must protect buildings from decay." Here we at once see the practical difficulty of the subject of repairs and the reason why so many disputes arise upon it. The landlord naturally takes a severer view of the tenant's obligation than does the tenant himself. "To keep this house weathertight a new roof is necessary," says the landlord; "a few tiles will be sufficient," replies the tenant—the truth generally lying all the time between the two extremes.

Having regard to these circumstances, probably the most interesting and useful chapter in this book may be considered to be that which is headed "Quality and Quantity of Repairs." Here, again, we are at once faced with the difficulty already referred to. For at the beginning of the chapter we read:—"A general covenant to repair is satisfied by the lessee keeping the premises in substantial repair, according to their nature and age, and a literal performance of the covenant is not required unless where the language points to any particular matter." But before premises can be kept in substantial repair they must be in a certain state of efficiency, and so it is the law that a covenant to keep premises in good repair has often been held to involve the putting them into it, because if he intended not to put them into a proper state a tenant might have contracted accordingly. So that we get this result—one which sometimes takes a tenant by surprise—that such a covenant "presupposes both to put in repair, and also that during the whole term the premises will be in repair." Next we get the matter complicated by the fact that regard must be had to the age and class of the premises. Strange as it may seem, it was not till 1890 that some of the results of this principle were expounded in the case of Proudfoot *v.* Hart, which for the surveyor is a very interesting and important case, because the judgment states judicial opinions on practical points with great clearness. It is impossible here to do more than give one quotation:—"With regard to paper, I cannot see how in any case a man can be bound to put new paper on the walls simply because the old paper which was on at the time when he took the house or which he has subsequently put on the walls is 'worn out.' . . . With regard to this point, again, I can only repeat that painting is decoration, and that it is not necessary for the tenant to paint the woodwork inside when it is only required for the purpose of decoration." More we cannot quote, but what has already been quoted will show how clearly principles are applied by the judges in this case to everyday facts.

And this case leads us to express the wish that the Surveyors' Institution would commission a competent lawyer and surveyor to prepare a code on the subject of repairs and dilapidations. It could not be absolutely exhaustive, and it could not cover every possible contingency. But it could give laymen a statement of the law on these subjects easily to be understood, and, what is more, easily accessible. At present, in order to find the solution of practical questions on these daily points, it is necessary to grope through legal treatises and judicial decisions, for it is hardly ever safe on this subject to rely too much on general principles. When a new Parliament is in existence it should be possible to pass such a code into law. The perusal of the useful book which has suggested the foregoing remarks will, we think, show at once the propriety and the possibility of such a code.

* "The Law of Repairs and Improvement, including Ecclesiastical Dilapidations." By J. H. Jackson, M.A., Barrister. London: Butterworth & Co. 1905.

NOS. 12, 14, AND 16, BISHOPSGATE-STREET WITHIN.—This property, extending from the Wesleyan Mission Hall towards Messrs. Baring's Bank, and facing the junction of Threadneedle-street, was recently disposed of by auction. The present buildings will be pulled down very shortly and new premises will be erected, providing on the ground floor and basement accommodation for a banking firm, and on the upper floors offices. Mr. Paul Hoffmann is the architect for the new building.

SMOKE-ABATEMENT AND LOW-GRADE GAS.

THE most noteworthy feature of the recent Westminster Conference on Smoke-Abatement was the general recognition of the fact that it is no longer necessary for hygienists to advocate the use of smokeless fuel for cooking purposes in our large towns. So long as the exponents of the advantages of gaseous fuel were merely leading men of science and medical practitioners the public would have none of it, but since cook discovered its manifold uses every peace-loving citizen has hastened to become a smoke-abater. For centuries the people of London have been calling for legislation to restrict the emission of smoke from domestic chimneys, but it has been reserved for the present generation to see smokeless fuel voluntarily and almost universally adopted as a substitute for bituminous coal for cooking purposes.

As evidence of the recognition of the value of gaseous fuel in restaurants the statement of Dr. H. Des Vœux that Messrs. Lyons, the well-known restaurateurs, spend 10,000*l.* per annum on gas for cooking may be quoted. Sir George Livesey's figures, showing that more than half a million gas-cookers are in use in that portion of London which is supplied by the three metropolitan gas companies, are sufficient indication of the popularity of gas for domestic cooking in London, especially when it is remembered that his estimate does not include many hundreds of thousands of ring-burners which do not rank as cookers, but which, nevertheless, are much used for cooking on a small scale.

For the heating of dwelling-rooms, however, the open coal fire still ranks first in popular esteem. The principal reasons for this preference for the coal fire are (1) it is cheaper than a gas fire when used for many consecutive hours; (2) it forms a very convenient crematory for private correspondence and other inflammable household waste; and (3) it is believed to be more conducive to good health.

With regard to the third point it may be said that a certain amount of prejudice against gas fires has been created by the sale of many fires of bad design, and sometimes by the faulty fitting of good fires; also through the common delusion that it is a satisfactory practice to connect a gas fire to a flue which has proved unusable with a coal fire owing to persistent "smoking." Well-designed gas fires connected to flues with a satisfactory up-draught are free from all objectionable features. Hundreds of gas fires are in use in the neighbourhood of Harley-street, W., in the houses of leading physicians and surgeons, and gas fires are commonly fitted in every bedroom in nursing homes. In most rooms it is necessary, in order to ensure good ventilation, to have a highly-heated current of air flowing up the flue. It is the so-called waste heat which makes an incandescent coal fire so efficient a ventilating agent, and in many cases it is the endeavour to economise by preventing the escape of waste heat up the flue which has created prejudice against gas fires. Unless special ventilating arrangements are provided the products of gas combustion should enter the flue in a highly-heated condition, and where gas is expected to perform the ventilating duties of a coal fire all forms of flueless and condensing stoves should be avoided.

With reference to the convenience of the coal fire as a waste-destructor, it may be remarked that gas may be adapted to serve the same purpose. It would be easy to design a gas fire having a removable vertical fireclay muffle, in which embarrassing correspondence and cigar-ends could be destroyed as readily as in a coal fire. It is merely a matter of cost.

The real obstacle to the universal use of gas fires as substitutes for coal fires is the higher cost of the former when used daily for several consecutive hours, and smoke-abatement advocates and gas engineers are now confronted with the task of devising a practicable scheme for the sale of gas at a cheaper rate.

At the recent Conference Mr. Ackermann advocated the distribution of producer-gas. The heating power of this gas is only about one-fourth that of coal-gas, and it contains fully fifty per cent. of incombustible gases. Mr. Ackermann stated that producer-gas can be manufactured, even on a small scale, at 3½d. per thousand cubic feet. This is true, but when to this sum is added the 3½d. per thousand for rates paid to local authorities by the Gas Light and Coke Company, and the necessary 8d. per thousand to cover the cost of distribution, management charges, interest on capital expended, etc., it will be seen that even producer-gas could not be profitably distributed in the metropolis to ordinary householders at a price below 1s. per thousand, which is equivalent to coal-gas at 4s. per thousand, a price much in excess of that charged by any of the metropolitan gas companies.

The only practicable method of reducing the price of gas supplied to the general public, without unduly affecting its value for domestic purposes, appears to be that of supplying gas of lower illuminating power, as has been proposed by Sir George Livesey, Mr. H. E. Jones, and other eminent gas engineers. At present the least objectionable method of effecting this is, in the writer's opinion, the conversion of some of the coke produced in the manufacture of coal-gas into plain water-gas (94 per cent. combustible), and the admixture by a suitable process of this water-gas with the coal-gas.

Unless, however, cheaper coal becomes available, or the by-products of coal distillation increase largely in value, there is little prospect that, even after the proposed alteration in the illuminating power of the gas, the charge to small consumers will fall below 1s. 6d. per thousand in any part of London. But at this price gas with a net calorific value of not less than 450 B.T.U. could be used with economy as a substitute for coal, even for the daily heating of dwelling-rooms. Gas of this quality would also be quite suitable for cooking and for incandescent lighting.

RETIREMENT OF EDINBURGH ROAD SURVEYOR.—Mr. David C. Proudfoot recently resigned his position as City Road Surveyor to the Edinburgh Corporation. He had been in the service of the corporation for thirty-six years.

NOTES.

Winchester Cathedral.

OWING to the condition of the pinnacles and cornices at the West front of Winchester cathedral the authorities have found it necessary to close the three western doors, leaving only the southern door open as a public entrance to the building. The effect of frost during the past few weeks has no doubt increased the somewhat perilous condition of some architectural details of the cathedral, but in view of the measures already taken for the auxiliary support of the walls threatened by subsidence of the foundations, there probably is no immediate danger of any alarming developments. We fear that the appeal for funds issued by the Dean has not met with so generous a response as could have been desired, and take this opportunity of expressing the hope that at the season when good resolutions abound the people of England will determine to aid in the work of preserving one of the most noteworthy landmarks in the history of the nation.

New Roof for Charing Cross Station.

GENERAL satisfaction will be felt by the travelling public, and by those taking an interest in the artistic appearance of the metropolis, that the directors of the South-Eastern and Chatham Railway have decided to substitute a new roof of modern type at a lower elevation, in place of the partially decayed and monstrous structure hitherto disfiguring the view along the Victoria Embankment. We have at present no details of the new design, but it will probably be somewhat on the general lines adopted in the enlargement of Victoria station, although, of course, Mr. Percy Tempest, with the invaluable co-operation of Sir Benjamin Baker and Sir John Wolfe Barry, will not be guided in matters of detail by any existing structure, and should be able to give us a thoroughly distinctive example of station roof construction. Quite apart from the initial cost of building wide and lofty roof spans, the difficulty and expense of maintenance, and the element of danger in such to the public, a lower type of roof is far more favourable for the escape of steam and injurious gases from locomotives, for the admission of natural light, and for the dispersion of sound waves. Preliminary works are now in active progress for the removal of the old roof, and it is hoped that matters will be so far advanced by February next that the station will then be re-opened for traffic.

The Protection of Steelwork.

IN a recent letter to the *Times*, Mr. Jackson, R.A., gave further currency to mistaken rumours to the effect that Portland cement does not afford reliable protection against the corrosion of iron and steel. It is true that the writer carefully abstained from supporting the view in question, but the fact that it has been thought worthy of mention by so eminent an architect is sufficient to give it a false importance in the minds of the uninitiated. For this reason we were glad to see a reply from Mr. Sachs, pointing out that rumours prejudicial to the preservative properties of Portland

cement can only be based upon the experience of those who have employed inferior qualities of cement in an unsuitable manner. We have repeatedly given data showing the valuable effect of Portland cement and concrete in preserving from corrosion any metal enclosed therein, and it is not necessary to cite particular instances on the present occasion. We may, however, remind our readers that the process of decay, commonly described as rusting, can only take place in the presence of three agents —oxgyen, water, and acid. Oxygen is a necessary constituent of the atmosphere, water in moderation is a desirable constituent, and acids are necessary and desirable according to their nature and the proportion they bear to the volume of the air in any particular place. By excluding any one of these agents from the surface of metal, the activity of corrosion is very small, and by keeping away all three it is entirely prevented. Portland cement, being almost impervious to penetration by gaseous bodies, will effectively protect steel from the action of oxygen, aqueous vapour, and acid gases; any water brought into contact with the metal by the wet cement or concrete is absorbed by the protective material, and the alkaline nature of the cement is sufficient to neutralise any acid seeking to gain access to, or accidentally present upon, the surface of the metal. These facts point conclusively to the reason why Portland cement compounds are so particularly suitable for the preservation of iron and steel.

Recent Tests of Concrete-Steel Beams. OWING to the extensive employment of reinforced concrete on the Chicago, Milwaukee, and St. Paul Railway, the Bridge and Buildings Department of the company have found it necessary to make a thorough study of existing data relative to the strength of concrete-steel beams. For the purpose of the tests undertaken thirty beams were prepared with the width of 12 in. and of depth varying with the number and diameter of the reinforcing bars so as to preserve the uniform proportion of steel at 0·75 per cent. of the sectional area of the beams. Three special types of patented bars were used as well as plain round bars, and the concrete had the uniform proportions of 1 part Portland cement, 2 parts clean sand, and 5 parts crushed limestone of 2-in. gauge. The beams were tested in a 90-ton machine providing a clear span of 12 ft. The detailed results of the tests will be found in a recent issue of the *Engineering Record*, and are too lengthy even for summarised reference in this note. The following are among the chief conclusions to be drawn from the investigation:—(1) That properly designed diagonal reinforcement is desirable to develop the full strength of the beam and to guard against the risk of sudden failure; (2) that small bars are better than large bars as reinforcement; (3) that the ultimate strength of a beam is attained when strain on the reinforcement reaches the elastic limit; (4) that with 0·75 per cent. of reinforcement and an average quality of concrete the neutral axis is situated at about one-third the distance from the centre of the steel to the top of the beam; (5) that very little error results from taking the stress area as triangular instead of parabolic.

The Water Main Burst. THANKS to the substantial manner in which all the details of waterworks undertakings are executed it is very seldom that any failure occurs similar to that which caused so much inconvenience, and did so much damage, on Tuesday, in St. Martin's-lane. Considering the enormous power latent in water under the head necessary for the supply of high buildings, and the voluminous discharge capacity of a large water main, it is not at all surprising that the street pavement should have been displaced and the whole street converted into a stream. At present we do not know what was the responsible cause of the accident. Even if defective or wasted away by corrosion, water pipes do not usually burst in the absence of some sudden shock. The rupture of mains that have been in use for a considerable time is almost invariably due to the too rapid closing of a valve, an operation that should be performed very gradually, especially towards the end. The necessity for extreme care in this direction is a sufficient reason for the circumstance that the torrent pouring down St. Martin's-lane continued for a period of some ten minutes. There is really no means of shutting off the water in less time than this without the certainty of causing failure elsewhere along the pipe line. Automatic stop valves are always provided at places were serious inconvenience would follow the fracture of a main, but the closing of such a valve cannot be effected with safety in much less than a quarter of an hour.

Leakage Electricity and Lead Poisoning. A SOMEWHAT alarming case of lead poisoning has recently occurred in a cottage on the Twyford Lodge estate in Hants. A sample of water taken from the cottage was found to contain 0·14 of a grain of lead per gallon, although an analysis of the water supplied by the company was perfectly satisfactory. The case was investigated by Mr. B. Latham, who has published the results of his researches in a paper read to the British Association of Waterworks Engineers on December 16. He found that the presence of lead in the water was entirely due to electrolysis, current having leaked into the lead pipe from the private electric lighting plant of Twyford Lodge. This points out a danger in connexion with electric lighting of which, so far as we are aware, this is the first properly authenticated instance. In the early days of electric traction in America, when practically no care was taken to bond together the rails which carry the return current, very considerable damage was done both to the water mains and to the service pipes and fittings. In these cases there must have been a considerable amount of carbonate of lead formed in the drinking water, and it would be useful to know if American medical men had noticed any cases of lead poisoning before the extensive corrosion caused by the leakage currents forced electricians to take the necessary precautions. This new danger is another reason why electric supply companies should use the greatest endeavours to maintain the insulation resistance of their net-works as high as possible. We found out some ten years ago that the insulation resistance to earth of some of the net-works of the London Supply Companies was only a few ohms, and that consequently their leakage currents are measured in ampères. Under these circumstances it is highly probable that evidence of electrolytic corrosion will be found sooner or later.

Fires on Underground Railways. THE Fire Brigade Committee of the London County Council have asked the Board of Trade to amend some of the minimum requirements for guarding against fire in underground electric railways. The recommendations made are due to the Chief Officer, who has recently inspected a station fitted with the "efficient hydrants, hose and fire prevention appliances" required by the regulations. He has suggested that the supply pipe must be at least 4 in. in diameter, and be connected with high-pressure water mains. He has also suggested that there must be at least two hydrants on each platform of a low-level station, and that extincteurs be supplied to each carriage and to each lift. Whilst agreeing in general with his recommendations we should like to emphasise the duty of railway companies to render a repetition of the dreadful accident which occurred in Paris on August 10, 1903, an impossibility. The loss of life on that occasion was due mainly to suffocation from the fumes of the burning materials. We think, therefore, that only fireproof materials, such as asbestos fibre, magnesium silicate, etc., should be used for insulating the electric wires used on the motors and for the lighting of the trains. We should like fireproof material to be universally used, as it is a protection not only against fire panic, but against explosions. Again, passengers waiting at the stations notice the great draught through the tunnels, and it is this draught which is a great source of danger in case of a fire. Possibly methods of stopping the draught in a tunnel in the case of fire have been devised; if they have been it would certainly increase the confidence of passengers if they were made known. If a screen could have been lowered across the tunnel at the time of the Paris accident there need have been no loss of life. We think also that automatic sprinklers might be provided at some of the low-level station platforms; in America the sheds used for tramway cars are often provided with them. Although a railway-station may not be considered a very hazardous risk by an insurance company, yet, in this special case, it is right that no precaution should be neglected.

Waterworks and Land Subsidence. THE decision in the case of Fletcher *v.* Mayor, etc., of Birkenhead is one of importance to owners of house property. The plaintiff was the owner of a dwelling-house and land, and the defendants, acting under their Gas and Water Act, had sunk a boring tube on land acquired by them for the purpose about 180 yds. from the plaintiff's house, and had been

pumping large quantities of water from this source. The subsoil which supported the plaintiff's property was a bed of wet running silt, and these pumping operations had caused a subsidence. In an arbitration the plaintiff had been awarded 1,200*l.* damages. The defendants contended that he was entitled to no damages, either at common law or by virtue of the statutory powers conferred upon them. The Court held that the plaintiff's property was "injuriously affected," and but for the statutory powers there would have been grounds for an action for nuisance at common law. Then as regards the statutes the judge held that sect. 12 of the Waterworks Clauses Act, 1847, was not confined, as the defendants contended, to the period during which the works were under construction, but applied to the water taken "from time to time" for the purpose of supplying the district. The Court also intimated that even if this section had not such an application, and that, as the defendants contended, they had general powers under their private Act, then sect. 6 of the Waterworks Clauses Act would still enable the plaintiff to claim conpensation, since this section qualifies the powers conferred by the special Act by introducing the provisions of the Land Clauses Act as to compensation.

Creosoting Timber.

A PAPER of practical value relative to the inspection of treatment for the protection of timber by the injection of creosote will be found in the current number of the *Proceedings* of the American Society of Civil Engineers. The author deals chiefly with the quantity of oil necessary for enabling timber to resist the process of decay and the attacks of sea worms. A point worthy of note in connexion with the creosoting treatment is that the protection afforded is directly governed by the depth of penetration and the quantity of oil injected. As, however, the depth of injection appears to be limited by the proportion of sap to heart wood, it follows that comparatively soft timber is most suitable for treatment, and that the most efficiently treated timber is least suitable for purposes involving abrasion. One weak point connected with creosoting is that the purchaser is rarely in a position to ascertain with any approach to accuracy the weight of oil injected and the uniformity with which the preservative agent is distributed in the various pieces of timber in a given consignment. The author argues that, if weight of creosote is the basis for contract, weight is the logical basis for treatment and its inspection. Hence three unit weights should be available—the weight of the green timber, the weight of the timber after the vacuum process, and the weight of the treated timber. The difference between the first and second represents the weight of the sap removed, and the difference between the second and third is the weight of the oil injected. Some useful hints are given in the paper, as well as a specification proposed for governing the creosoting of green timber. If the recommendations here made are generally approved the practice of firms engaged in this method of preservation will have to be modified so as to give better opportunities of inspection during the successive stages of the operations conducted.

Sanitation in India.

A USEFUL summary of the many reports issued by Imperial, provincial, and municipal authorities in the Indian Empire is to be found in the annual Blue-book published last week. We are sometimes apt to forget that our great possession in the East includes some 300,000,000 persons, and the immense difficulties that have to be overcome in persuading so huge a congregation of conservative-minded people that the measures proposed for their benefit are really calculated to do good. Unfortunately, sanitary science seems to have had but little effect in checking the ravages of the plague, but in other directions there are satisfactory indications of substantial progress. One of the most striking proofs of the benefits conferred by the British administration of India is furnished by the statement that at the present time some 2,500 hospitals and dispensaries are in existence, where more than 372,000 indoor and about 22,400,000 outdoor patients were treated during the year to which the reports refer. In various large cities considerable attention is being devoted to the problems of water supplies and drainage, and in Calcutta satisfactory progress has been made with the important works of sweeping away insanitary areas, opening up new thoroughfares, providing additional open spaces, and improving the water supply and drainage systems.

Nottingham Castle and Museum.

THE City Council have applied to the Local Government Board for sanction to borrow 10,000*l.* for the repair and reconstruction of the castle museum, upon the lines of a scheme framed by Mr. F. B. Lewis, City Architect. In 1831 the Reform Bill rioters burned the mansion which William (Cavendish), first Duke of Newcastle, had built in 1670-6 upon the castle hill; the fabric, designed after the Classical style, remained in ruins until about thirty years ago, when the corporation obtained a 500 years' lease from the trustees of Henry (Clinton), sixth Duke, conditionally upon their undertaking to preserve the castle as a national monument and to expend 15,000*l.* in restoring the main structure and appurtenant premises, for purposes of a museum of science and art, with music hall, reading and lecture rooms, etc. The present proceedings are the outcome of protracted negotiations, which have at length assumed a definite shape, and the corporation propose to devote a part of the loan to a restoration of the gateway and the strengthening of the bastions and walls. The original fortress, which had been rebuilt in 920 after a predatory incursion by the Danes, gave way to one erected by William the Conqueror, on the summit of the eminence rising above the River Leen. That stronghold, as refortified in the reigns of Edward IV. and Richard III., ultimately fell into the hands of the Parliamentarians, and, having been dismantled by Cromwell, was pulled down by William, Duke of Newcastle, who had bought it from the Duke of Buckingham. The museum contains the late Felix Joseph's bequests of Wedgwood ware, and drawings and designs by T. Stothard, R.A., Lord Savile's gift of classical antiquities from Italy, the Jacoby collection of old hand-made lace, and some oil-paintings given by the widow of G. Jones, R.A., including views of Rome, Nuremberg, and Frankfort, and of Edinburgh Castle from the Grass-market.

Cromwell House, Highgate.

THE leasehold interest of this property, which covers about 1¼ acres, and has an unexpired term of thirty-three years, will shortly be offered for sale. The house, standing on the east side of Highgate-hill, opposite Waterlow Park, has latterly been occupied as a convalescent home of the Great Ormond-street Hospital for Sick Children. It is generally believed that Cromwell either built or bought the house and gave it to his daughter when she married General Ireton. It contains many interesting features, amongst them being the carved woodwork, and the fine staircase, which is ornamented with figures carved in oak, and wearing the uniforms of soldiers of the Parliamentary forces.

THE PROBLEM OF RURAL HOUSING.*

THERE are two great difficulties in the way of getting good cottages built for country labourers which might be removed by the spread of knowledge. One is the prevailing belief that you cannot put up a presentable and well-built cottage for less than 250*l.*, or at least 200*l.*, and the other is a lamentable ignorance of the practical requirements of those who are to live in the cottages. Both of these are matters in which a Society like this can do excellent work by mere propaganda.

To take the first difficulty. I believe there is quite a large number of landlords who are still firmly persuaded that you cannot build a five-roomed cottage under 500*l.* for the pair; while there are yet more who, though admitting that 300*l.* for a pair is a possible price, think that such cottages must necessarily be mean-looking, jerry-built houses such as we see put up in streets in the factory districts, and they naturally hesitate to disfigure the countryside with such buildings.

Indeed, the question of appearances is one the importance of which must be recognised even by those who might be prepared to neglect it altogether in favour of mere utility, for, until we can dispel the false impressions that prevail on this point, we shall always have a strong opposition to the increase of cheap cottages. For this reason, therefore, if for no other, I think it is very desirable to demonstrate that it is possible to build for a cost of about 150*l.* a country labourer's cottage with all reasonable requirements, which shall at the same time be well built and shall not be an eyesore on the landscape.

And first of all as to price. The sum of 150*l.* is fixed upon as being somewhere about the capital outlay which will admit of a reasonable rent to cover a low rate of interest and depreciation. It is a common error to say that agricultural labourers' cottages can only be built at a loss. The truth is that the provision of cottages at nominal rents is part of a complicated system of payment of wages in kind. If you will examine carefully the estate system which prevails throughout the greater part of the country you will find that the general custom is for the landlord to provide cottages at low or nominal rents, in order to secure cheap labour for himself and his farm tenants. This is, of course, a great check upon the

*A Paper read at the Annual Meeting of the Rural Housing and Sanitation Association, November 21, by Mr. Fairfax Cholmeley.

building of 'cottages by others, and a hindrance to putting in force the building powers of district councils and other public bodies. But it is absolutely erroneous to argue from the existing rents that labourers' cottages cannot be built to pay a reasonable rent.

Supposing we are able to produce the required cottage for 150*l.* or thereabouts; it would be possible to get from 3s. to 4s. per week for them from labourers whose wages were 1*l.* per week, which is the average earning of ordinary country labourers in some parts of England where they are properly paid. It may be open to employers to pay 16s. per week or less, and give in the cottages for nothing or for a nominal rent, but it is unreasonable to argue from that that cottages cannot be built to pay.

However, I do not propose to enter into a controversy now on the question of how you are to alter such a bad system, nor even to argue in favour of my opinion that it is a bad system; I merely wish to clear the ground for assuming that 150*l.* or thereabouts is the sort of sum which we should aim at as the cost for a country labourer's cottage.

Now it has been very justly remarked that it may be easy enough to build a cottage for 150*l.*, or even less, but that such cottages are dear at the money if the workmanship and material are not good and sound; for in a badly-built cottage the bill for repairs will be high. We have, therefore, something more to take into account than the mere initial cost.

I think, perhaps, the best thing I can do, in discussing this and other details, will be to take a concrete case, as I have myself a plan which I have used as a model for labourers' cottages at Brandsby, in the North Riding of Yorkshire. This cottage has been built for 150*l.*, and special care has been taken with the quality of the work and construction. Indeed, to give an example of this, I may say that I have all the tiles pierced for nails, to my special order, instead of laying them on with mortar only, to hang by the lip, as is the usual custom throughout that part of the country.

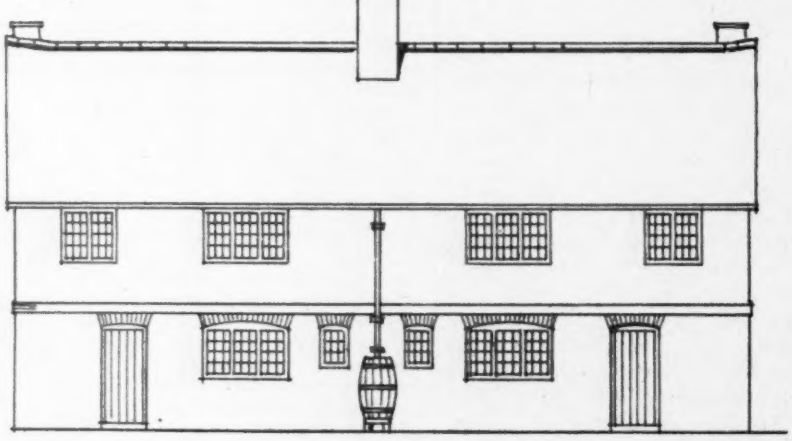
Here let me say that I am able to give proof of the cost of this cottage. The agent of a well-known estate visited me some time ago for the purpose of looking at these cottages, and, though he was sceptical as to the cost, he asked for tenders from builders, and received two which came out at a trifle under 300*l.* for the pair. My own builder, too, informed me that he had built by contract a single cottage with parlour on the plan I have here in a very inaccessible village to which bricks had to be brought by traction from a considerable distance, and that he had accomplished it for under 160*l.* I am quite satisfied from my own experience that a country builder, who works on the job with his men, can build these cottages in pairs for a price varying from 140*l.* to 160*l.* each according to circumstances, though, no doubt, a contractor who did not work himself would require a larger margin of profit.

So far as external appearance is concerned, one must trust to simplicity and proportion rather than to ornament. Bad ornament is far worse than none, and you cannot have good ornament without materially adding to the cost. It is a great mistake to think that you cannot get a good effect with a severely straight building, and that a porch or a gable is in itself beautiful. On the contrary, porches or gables that are out of proportion, badly shaped, or made of ugly material such as ugly-coloured tiles, generally increase the ugliness of a building, while greatly adding to the cost. . . .

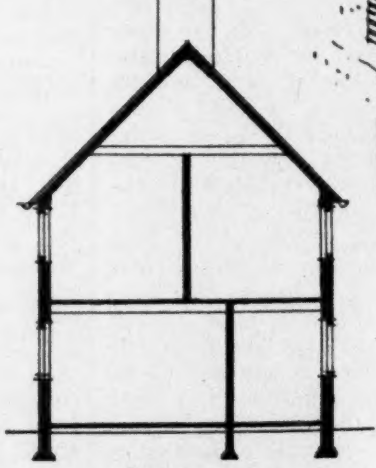
In the Brandsby cottage you see a perfectly straight building with a line of slightly-projecting bricks running the entire length on the level of the bedroom floor. That line, called a string-course, by making the cottages look lower, improves the proportion, and the extra cost of it over a plain wall might be estimated at about 1*l.* or under. It is a good example of what may be done to improve appearances by simple means. I must say that in the cottages I have built so far it has been omitted, because I have been experimenting, but it will be put in all future buildings on this plan. Again, in the elevation I have shown a slightly steeper roof than I have actually built, and also I have shown an extra course of bricks above the bedroom window. Both these small alterations make all the difference in appearances, and can be made at a trivial increase in the cost. These cottages should be either whitewashed or covered with ivy that is to be kept well trimmed every year. And may I say here that it is quite a mistake to think that ivy makes the walls damp. Ivy will protect the walls from driving rain, and, on account of its glabrous leaf, will remain dry underneath the foliage. Whitewash, too, if composed of lime with a mixture of Russian tallow, will protect the walls and give a fine appearance with red tiles.

The next question is whether your cottages should be single or in pairs. It is needless to say that building in a row is most undesirable and should be avoided where possible, but I doubt whether it is worth while making sacrifices in order to build single cottages to stand detached. In a pair of cottages built for labourers who are working for wages, not for small holders with land and buildings attached, you can get practically as much privacy as is required; and, as the cottages are built with 9-in. brick walls, it is an advantage to save one outside wall for the sake of warmth.

THE BRANDSBY MODEL COTTAGE.

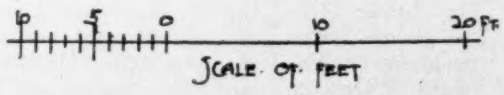


FRONT ELEVATION

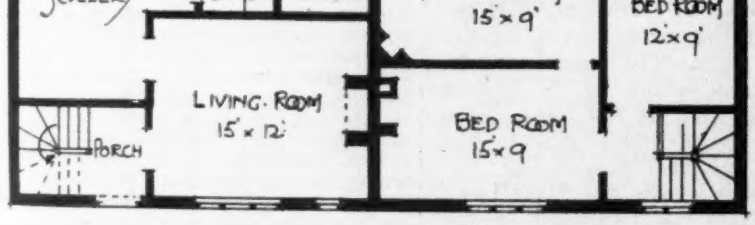


SECTION

PLAN AND SKETCH OF EARTH CLOSETS



SCALE OF FEET



HALF GROUND FLOOR PLAN. HALF 1ST FLOOR PLAN.

ALTERNATIVE GROUND PLAN

You will notice that in the Brandsby cottages, which are built in pairs, there is only one outside wall to each room, with the exception of one bedroom. Moreover, it is not altogether a disadvantage to have a next-door neighbour to help at times, especially in cases of sickness, and the necessary privacy can be secured where it is wanted at the back door by a palisade 6 ft. high to run a few yards to the outbuilding. Again, to prevent conversation from the neighbour's cottage being overheard, the partition wall between the two should, of course, be a 9-in. wall, and the roof timbers should be disconnected, so as not to act as a telephone between the adjoining houses.

The separation of the back doors by a sufficiently high fence running a few yards from the house is really important for comfort and peace, for there are more quarrels between neighbours arising from the back-yard than from any other source.

Next, as to internal arrangements. First of all, let me emphasise the importance of providing a kitchen living-room, which has not got a door entering into it straight from outside. In the Brandsby model I have contrived a lobby at the entrance, from which the staircase leads to the bedrooms. The living-room itself should be the best room on the ground floor, but should not be too large to be easily warmed by a moderate-sized fire, and it should not have more than two doors into it. A good size is 15 ft. by 12 ft.; a greater length makes a cold end to the room. If possible the doors should be kept to the end of the room furthest from the fire. One of the commonest faults in the cottages at the exhibition at Letchworth was in this matter of doors. Many had a door next to the fireside corner—I wish the designer had to sit there on a cold winter's night with a blast blowing through to "improve" his rheumatism—and many more had three and even four doors into the room, sometimes one straight from out of doors, to say nothing of picturesque staircases open to the room to provide a pleasant draught on a cold winter's night. The avoidance of these very real discomforts is far more important than such luxuries as the ceiling of the lower rooms with lath and plaster or adding to their height. In the Brandsby model the kitchen is 8 ft. high to the floor boards above, and I have saved 7 in. in the height of the building by leaving the floor joists unceiled. A greater height than this is unnecessary in the country, where there is abundance of good air coming into the house through open doors all day, and where the majority spend their life out of doors. I can speak with some certainty on this point, for I have lived in such rooms both summer and winter, and am confident that the height is sufficient. The money saved by the economies I have mentioned is far better spent in other comforts, such as larger area, better bedrooms, and other things I shall mention.

As to the bedrooms, I think I need not spend time in arguing the necessity of three bedrooms; but it is by no means necessary that there should be separate entrances to more than two. Except where it is intended to make provision for lodgers, the space is more valuable in the larger rooms than in a passage.

In the plans you have before you a separate entrance could be made to the third bedroom with ease by sacrificing a few feet in the front bedroom, and even then the bedroom area would still be larger than in most of the Letchworth exhibits. Indeed, in many of the cottages there, the third bedroom was much too small. A fireplace in each bedroom is worth more than many unnecessary luxuries often provided, more even, I think, than the bath, for which so much has been sacrificed in many instances.

There is one other matter about which there is often a great deal of controversy, and that is the parlour. Like many other people, I was at one time strongly prejudiced against it, but I have since become convinced that if it is possible to provide one—and quite the smallest room in the house will do—it is well worth doing so. Miss Cochrane has given many excellent reasons for this in her leaflet published by this Society, and I can thoroughly endorse what she says from my own experience. The woman who takes in sewing or washing will use such a room for storing her clean, finished work, as well as for her sewing machine, if she has one, her little treasures also, or anything she wants to keep out of the way of the children or the soil of household work, to say nothing of the convenience of having a room into which the chance visitor may be shown—the clergyman, doctor, or squire's lady—when it is not always convenient to let them penetrate into the midst of the household.

A little more real knowledge and sympathy would soon dispose of the bourgeois prejudice that sums up the claims of a parlour as merely a snobbish desire for a place to store fine furniture. If it is useful for no other purpose, it is, at all events, a place in which a coffin may be placed; perhaps the mention of such an eventuality may bring home to those who have never thought of it the difficulties of those who have to live in a cottage with only one living-room where there is any aspiration to preserve the decencies of life.

There is, however, one other matter of considerable importance which has come prominently before the public lately, and that is the question of by-laws. There has been quite rightly a revulsion of feeling against the foolish by-laws that have been adopted in many country districts, which are quite unsuited to the surrounding circumstances; but it would be a fatal mistake to assume that there should be no by-laws at all. That would be merely playing into the hands of rural slum-owners. The Local Government Board has during the last few years compiled and issued a set of model by-laws for rural districts to which nobody could take objection on the score of strictness. They merely provide for the elements of sanitation about a cottage, such as proper windows in each room, an effective damp-course in the walls, and preservation from sewage pollution. There is great need for such regulations, and, where such by-laws are adopted, the only evils of importance that can arise from them will be due to corrupt administration and malevolent attempts to create difficulties out of the letter of the law by interested parties who may for the time hold places of public trust. But the remedy for such evils is exposure and dismissal, rather than abolition of necessary laws.

In conclusion, I should like to say that the Brandsby model, which I have so constantly referred to, is a cottage that fulfils the requirements of such by-laws, and can be built in any ordinary circumstances for about 150*l*. I have shown two ground plans, in one of which a parlour is provided, to the detriment of the scullery and the exclusion of the coal-house. This latter plan would cost more than 150*l*., by the cost of a separate coal-house. I must apologise for having talked so much about a child of my own invention, but it affords a concrete example, with the details of which I am familiar. It has, however, been built to meet certain local requirements, and it is quite possible that other places and conditions might demand alterations of detail and even changes in the plan. What I have tried to show is that it is possible to build such a cottage as a labourer can live in decently and comfortably for a sum that will bring in a reasonable return either directly or indirectly.

We append some notes on the construction of the Brandsby model cottage:—

1. The windows are "Yorkshire (sliding) sashes," not ordinary *cord* sashes. Casements may be substituted where "Yorkshire sashes" are not liked, but they will be a little more expensive.
2. The doors are "batten" doors with Norfolk latches.
3. The partitions between the two large bedrooms and that between the small bedroom and the staircase lobby are of lath and plaster. The laths should be riven, not sawn.
4. The floor joists over the kitchen are unceiled, and are 7 in. by 2½ in. The roof purlins are 9 in. by 3 in., and must be of the best well-seasoned timber. The span for the purlins in the two big rooms is a long one.
5. The height of the kitchen is 8 ft. from the floor to the boards of the floor above, and the height of the bedrooms is 6 ft. to the top of the windows. The rafters are ceiled underneath, allowing the slope of the roof to be seen as far as the purlins. A flat ceiling is drawn across under the purlins. A flap ventilator may be placed in the chimney to ventilate the air space in the bedrooms above the windows.
6. The tiles of the ground floor must be set upon concrete.
7. The partition wall between the two cottages must be a 9-in. wall.
8. The roof is of "pantiles," hung by a "lip" and secured by nails.
9. There are cupboards on each side of the kitchen fire-place in the nooks formed by the chimney brest, and there is a cupboard under the stairs.

NOTES ON NEW BUILDINGS IN LONDON.

IV.—The New Gaiety Theatre and Gaiety Hotel and Restaurant in the Strand.

These two blocks of buildings form undoubtedly one of the best and most effective recent contributions to our street architecture, and the position which they occupy at the entrance, as it were, to the new building domain in connexion with Aldwych and Kingsway is so striking and important in an architectural sense that we must be gratified to notice that so fine an opportunity has not been thrown away.

The introduction of the circular tower with its effective cupola at the angle of the site is peculiarly fitting for such a position, and seems in fact the only means by which the architectural difficulty of the awkward angle at this portion of the site could have been got over. As it is, the difficulty is not only avoided but is made (as all difficulties in the plan of a site should be made) an opportunity for a special architectural effect. The base of the building is of Portland stone, simple and severe in its treatment, with its numerous doorways leading to and from the various parts of the play-house. These doorways are of a pleasing proportion, having plenty of width in proportion to their height. The quaint-looking wrought-iron exit notices to all these doorways, however, do not add to the architectural effect, and the iron and glass shelters overhanging the footway detract somewhat from the general monumental feeling of the lower portion of the building. The small window openings introduced in an artless manner in the Strand elevation seem to suggest their realistic value, inasmuch as the occupants of this building will not want to be always observing the goings-on in the outer world. The windows lighting the offices on the principal story are well defined, forming a noteworthy feature, and in strong contrast to the small and simple-looking window openings directly over them, and which give light to the dressing-rooms on this side of the building. The loggia, again, gives welcome relief to the upper portion of this elevation, with its cornice of good proportion and detail, and a fine balustrade crowning the whole. On the ground story it is also pleasing to note the marking of the stage entrance, or "stage door," as it is commonly called, by the bold semicircular-headed porches, and also the scenery entrance to the stage by the large, simple, square-headed doorway.

The curve of the façade towards Aldwych, though it must have caused difficulties in the plan, is for architectural effect a clear gain, and the large mass of wall in the lower portion makes a fine contrast with the colonnaded loggia which crowns it. There are points in detail, however, which we must regret, and which are hardly worthy of a design which is so striking as a whole. Among these we must reckon the immense consoles or scrolls which form the termination of part of the front and side walls where the break for the circular tower occurs, and which to our thinking are coarse and out of scale. We may no doubt have Sta. Maria della Salute quoted against us, but we doubt if its scroll buttresses would be regarded as a satisfactory feature if anyone designed a modern church on those lines; they are interesting from association rather than as features for imitation. The consoles and swags under the large windows are also poor in detail, and one almost wonders how they got into such a design. The choice of the marble for the bands introduced into the stonework gives a warning as to one little point of effect. The mottled character of the marking of this marble, the lighter portions of which assimilate rather to the tone of the stonework, has the effect, at a little distance, of confusing the eye in regard to the joint of junction of the marble band and the stone cornices immediately above and below, so as to give a ragged effect instead of the clear sharp line which is desirable.

The treatment of the cupola and its immediate substructure is picturesque and effective, though here the detail will not bear too close consideration. The building must be taken as a whole; and in that sense it is certainly exceedingly striking and effective.

The adjoining building, the Gaiety Hotel and Restaurant, though it naturally aims at

less in an architectural sense, is—with the exception of one point to be noted just now—even more satisfactory than the theatre. Its great solid mass, accentuated by powerful rustication at the angles, and crowned with a simple but equally powerful cornice at the top, is exceedingly grand and imposing, and the details are better and more refined than in the theatre building. In particular the introduction of the large panels of sculpture in low relief, between the windows of the top story, has an excellent and truly artistic effect. The immense mass of the building, with its severe and simple treatment, is even more striking on the east front, which unfortunately will eventually be little seen, as it flanks a narrower roadway which will no doubt be built up with equally tall buildings on the other side. On the Strand side there is room to see the building. The main entrance to the hotel is near the centre of the Strand front, and is a little disappointing in not having been treated with more importance and architectural effect It is supported, on the one hand, by substantial circular-headed openings to a buffet, and, on the other hand, in a similar manner by the entrances to Short's wine-house. The windows of the first story are finely proportioned and decorated, and form a pleasing relief to the grand simplicity of the mass, whilst the windows to the upper stories are simply and plainly introduced in a characteristic fashion.

On the east side the continuous balustraded balcony on the first floor level is an effective feature, and is in keeping with the solid and monumental masonry character of the whole building. The unbroken line of the cornice is an important element in this monumental character. It is refreshing to see a building which is free from that perpetual fidgetiness and breaking of lines of which we see so much in our modern street buildings.

The point, referred to just now, which we think very much open to question, is the almost calculated deviation of the ground-floor arches and window openings from the centre line. Of course what is intended to be conveyed is that the windows are simply disposed in the manner in which they are most conveniently required inside, and not in accordance with a merely conventional external symmetry. It conveys the impression, however, of having been, as we said, "calculated"—deliberately adopted to produce an expression of architectural freedom. Now we can quite agree that a heavy and massive arcaded ground story may be treated and regarded as if it were a solid wall, and the openings above it may ignore its arch centres; but when the keystones of the ground floor arches are brought close up to the sills of the window openings above, this separated and independent effect is not produced, and the result has an awkward appearance. The tiers of windows above the first floor are again out of centre with the first floor windows. To some, and we suppose to the architect who designed this building, this non-axial treatment of the windows may be regarded as a picturesque elusion of formal symmetry; but though it may be interesting to find it now and then, in old as in new buildings, it is after all an eccentricity, for which the best Renaissance buildings, and those which have commanded most general and permanent admiration, give no precedent. Then it is a question of construction also. On the east side we notice that the first floor windows are central with the large ground floor arches, but all the tiers of upper windows are independent of this centre line, and take a separate one of their own. The result of this is that very lofty and massive stone piers are built on the top of window openings, the flat stone arch of which could not support them, so that we are led at once to the conclusion that the masonic character is illusory, and that there must be a steel beam in the rear. This kind of arrangement (or derangement) of openings, whatever may be thought of it as architecture, is unquestionably bad building.

WAR MEMORIAL, GUILDHALL.—A memorial, executed in bronze by Mr. F. W. Pomeroy, is to be erected in the Guildhall, against the wall on the south side, to commemorate the services of the Royal Fusiliers, City of London Regiment, in the South African War, 1899-1902.

THE ARCHITECTURAL DEVELOPMENT OF CITIES.

PROFESSOR BERESFORD PITE recently delivered a lecture before the members of the Leeds Philosophical Society on "The Architectural Development of Cities." Dr. Eddison, the President, occupied the chair.

Professor Pite began by laying down the principle—as the man so were his buildings, as were the buildings so was the street, as were the streets so was the city, and, conversely, as was the city so were the men who built it. A character was imparted to the citizens by the noble or mean aspect of their city. We had few instances at home that would repay attention like those at Liverpool around St. George's Hall, and at Cardiff, in the Bute Park, where the new municipal building, law courts, university, and museum were being grouped on a grand scale in harmony with the picturesque adjoining castle. The new city plans would have to be sought abroad—on the Continent, or in America, or in our Colonial Empire. Probably Turin and Berlin were characteristic of the most modern schemes on the Continent. He next proceeded to throw on the screen views of streets and public buildings in London, Paris, Berlin, and Vienna, drawing comparisons more or less favourable to our own metropolis. The special characteristics of the three Continental cities just named, he said, were the extraordinary effects of aggregated public buildings, every one of which had a purpose and a meaning. He remarked, in passing, that there seemed to be a settled pessimism among architects on the subject of the general aspect of our cities. Financial considerations entered largely into the question, and it became necessary to wait for times of prosperity before a change was made.

Referring to London he gave instances to show that each district or borough afforded opportunities for the local exercise of municipal patriotism, and he specially dwelt upon several of the most modern street improvements. The sweep of the curves of the river had afforded fine scope for the effective laying out of London, and the Thames Embankment, to the beauty of which, he said, Englishmen were scarcely yet alive, came in for high praise. Along the river from Somerset House to Fulham the buildings punctuated the historical progress with architectural effect, which effect was not even excelled by the Champs Elysées. The laying-out of the Place de la Concorde and of the Tuilleries Gardens, however, was very instructive to all who had to lay out public parks and gardens. The fine great school of architectural gardens seemed to have died out in England, and the art was lost so far as this country was concerned. The combining of trees with public buildings in the Champs Elysées and the Unter den Linden had, in his opinion, a doubtful effect, for the trees interfered with the effect of the buildings. In showing the Rathhaus of Vienna, he pointed out that our efforts in Gothic architecture had produced remarkable results on the Continent.—*Yorkshire Post.*

ARCHÆOLOGICAL SOCIETIES.

BRITISH ARCHÆOLOGICAL ASSOCIATION.—At the evening meeting, on December 20, Mr. R. H. Forster in the chair, a paper was read by Mr. C. H. Compton, V.P., on "The History of the Abbey of Arbroath," situated some seventeen miles east of Dundee. The remains of the Abbey have recently been acquired by H.M. Commissioners of Works to be preserved for the use of the public. The Abbey was founded by William the Lion in 1178, who largely endowed it, and on his death, in 1214, was buried before the high altar of the Abbey church. The Abbey was colonised by Benedictine monks from Kelso, Reginald, one of them, being the first abbot. Owing to its exposed situation on the shore of the German Ocean, as from the unsettled state of the Scottish government during the XIIth, XIIIth, and XIVth centuries, it was subject to the vicissitudes of the wars with England and internal feuds, as well as to the fury of the elements on several occasions, and to a dispute between the Ogilvies and the Lindsays, which ended in the subjection of the latter in 1350. In the year 1240 litigation arose between William de Ros and the abbot concerning the advowson of the Church of Haltwisel, which ended in 1329 in favour of the abbot. It was at this abbey that Robert Bruce, in 1317, received the messengers from the two cardinals sent by Pope John XXII., after the battle of Bannockburn, commanding a truce for two years under pain of excommunication, with sealed letters addressed to Robert Bruce, "governing in Scotland," to which he made the spirited reply refusing his consent so long as the Pope and his legates, under English influence, withheld from him the title of king, and it was here that Bruce convened a Parliament of the nobility of Scotland, in 1320, when they framed their remonstrance to Pope John on account of the hardships which Scotland lay under from the anathemas of his Holiness and the invasions of Edward I. In 1523 David Beatoun succeeded his uncle, James Beatoun, as Abbot of Arbroath. The abbot and convent also appear in Queen Mary's reign on several occasions in support of her claims. The Act of Annexation, in 1587, attached the temporalities of the Abbey to the Crown. John, Lord Hamilton, commendator of the Abbey, who was created Marquis of Hamilton, remained in possession until April 17, 1599, when he resigned the Abbey into the King's hands, who confirmed the same to his eldest son, James Hamilton, and on July 6, 1606, the King and Parliament dissolved all the temporalities of the Abbey and created them into a temporal lordship in favour of James, with the title of a lay Lord of Parliament, and the Act provided that the memory of the Abbey should be extinguished.

Correspondence.

STANDARDISING QUANTITIES.

SIR,—I feel certain that the majority of those engaged in the profession known as "quantity surveying" will be obliged to you for opening your columns to the subject of standardising quantities. It has been a subject of the greatest interest to me ever since, some thirty years ago, I began to realise that there was no fixed rule on the subject of methods of measurement, order of billing, trade descriptions, or anything of the kind, but that each of the older surveyors followed his own custom with very little regard to the practice of any other.

The growing generation has a right to insist that with the improvement in education and the improvement in modern methods, and especially with the increased value of the magic letters F.S.I. employed by your correspondents in the present issue of the *Builder*, a clear and definite system should be laid down by the heads of the profession.

The Surveyors' Institution has recently appointed a Special Committee for the purpose of dealing with such questions as relate chiefly to quantity surveying, and if that Committee is going to justify its existence one of the first subjects to which it should turn its attention is the particularly important one now being dealt with. I have always been of opinion, although I am aware that many of my professional brethren differ from me, that it would be both advisable and possible to prepare a standard bill of quantities; it would necessarily be of very great length, but would embody the whole of the items likely to be used in any building of any class; from which it would be a comparatively easy matter to eliminate the items not required in the special building dealt with. If such a standard bill were issued with the authority of the Surveyors' Institution, and with the recommendation of the Committee referred to, and if all the members of the Institution agreed to arrange their quantities by this standard, and to take their measurements in the method adopted in it, the work of the quantity surveyor would be rendered more methodical and more presentable, and it would undoubtedly be far easier to "train up our 'pupils' in the way they should go."

A cynically disposed person might observe that it would become a simpler matter than it is now for the charlatans and quacks of our profession (and unfortunately our profession is as much as any other open to this evil) to issue bills of quantities which would more approximately resemble the proper product of a trained quantity surveyor than their efforts do at present; but I venture to think from the experience I have had that nothing in the world would really enable such imitation bills of quantities to be prepared as would deceive the expert eye; whilst I am equally convinced that contractors who are tendering in competition with an eager desire to work, and who are not now restrained from tendering by the fact that quantities are obviously bad, will themselves be greatly assisted by standardised quantities to discover whether those quantities have been properly prepared or have not. It is a matter in which the public takes exceedingly little interest, but I think you will find among those who know its importance a

consensus of opinion that the suggested step is in the right direction.

A great difficulty that presents itself to any practical man in propounding a scheme for a standard bill is that in more important and elaborately detailed work the method of taking is naturally more elaborate than in simple and plain work. Quantities for a workhouse or for a cathedral are naturally of a different character, and there are many vital distinctions between those for building and for engineering work. I have seen an engineering bill of quantities in which the price of the brickwork per rod was inclusive not only of all cuttings and other labours, but of facings, arches, etc. It would be necessary to have two different masons' bills, one of which would provide for the stone classified and the labours described, and the other for the stonework taken, and all the independent labours measured; but this, although it would lengthen the standard bill of quantities, would give a choice in the preparation of the quantities to the client who desired the stonework bill prepared in one method or another.

Of course, one other difficulty occurs. The preparation of a standard bill of quantities would be a work involving a great deal of time and labour; but the Surveyors' Institution is rich, and some of its funds might be wisely spent in remunerating some chosen person to prepare a draft standard bill of quantities which could be brought into shape by the efforts of the Committee.

HENRY NORTHCROFT, F.S.I.

SIR,—I should like to be allowed to add a few words to the discussion raised by Mr. H. Riley.

I venture to think that there is not so much difference in "bills of quantities" prepared by London surveyors as has been suggested; the main point in which they do not agree being in the measurement of "labours."

In recent years there has been a greater tendency to lump items together and to include as many labours as possible with the description of materials. The older, and, I think, the more accurate custom, is to measure all labours whose value and quantity cannot be accurately ascertained from any general description included with the material on which the labour is required. Quantity surveyors are, as a rule, so pressed for time and have their fees so reduced that steps have sometimes to be taken to shorten the bills, and so save time and expense in the preparation of same, to the detriment of detail and sometimes even accuracy in "taking off." This makes it very hard for the estimator to realise the actual value of the work entailed in executing various items, without constant reference to the drawings (if he has them) and even necessitating a certain amount of "taking off" on his own account which the quantity surveyor is supposed to have been paid to do.

Again, many surveyors measure separately labours which are not recognised at all by other surveyors.

With regard to the mode of measurement of materials, surveyors are, I think, pretty well agreed, and if some understanding could be arrived at on the measurement of labours, though I fear it would be somewhat difficult, quantity surveyors and builders generally would greatly benefit thereby.—Yours faithfully,

C. EDW. PEASE, P.A.S.I.

SIR,—I am very pleased to read in this week's edition of your paper that Mr. L. A. Francis, F.S.I., suggests a representative of the building trade should attend each committee meeting. I am sure there are many members of the L.M.B.A. who would take a keen interest in this important discussion, and would be glad of the opportunity of being present.

The question raised by Mr. Henry Riley is, from a builder's point of view, a most important one, and would, I am sure, be of great assistance when pricing quantities, and help considerably in getting more reliable estimates. It would, in my opinion, also tend to limit the great disparity sometimes seen between the highest and lowest tenders.

F. G. MINTER.

LONDON COUNTY COUNCIL AND DISTRICT SURVEYORS.

SIR,—Some time ago in your valued paper an article was written regarding the difficulties builders and others experienced in finding out who was the acting district surveyor in the interim owing to the long delay in appointing new district surveyors to the vacant districts.

Having read in your last week's issue what the Council now propose to do, it does occur to me, seeing that it is proposed by the Building Act Department of the London County Council (as reported to the General Council at their meeting on Tuesday week last) to do away with something like twenty-four districts from the vast area of London, that the difficulty of finding out who the district surveyor is, and perhaps of obtaining his prompt attention to certain works that may be required to be done, will be very considerable to builders and others of the general public.

Apart from my own personal convenience and the general satisfaction I have met with in dealing with district surveyors, and believing them to be a highly capable body of men, to gradually retire or do away with the services of twenty-four of these gentlemen (seven of the districts now being vacant) might be considered unfair, and I should judge that they may have something to say to such a procedure, for it is highly probable that in most cases they have relinquished most of their private practise for the effective carrying out of the work of their office.

Considering that the additional Amendment Act, 1905, which has just been sanctioned by Parliament, and is coming into force January 1, 1906, entailing, as it will do, more work in the various districts, I should have thought that more district surveyors should have been appointed to have effectively carried out the various Acts for the general benefit of the community, and not a less number, as proposed by the Building Act Committee.

What with the constant "jigging" with Acts relating to buildings, etc., in London, soon no one, not even district surveyors, will be able to say definitely what is necessary to be done.

Now that there is a fairly good knowledge of the existing Building Act on the part of builders, it seems to us that it would be a good thing to leave well alone.

C. Y. C.

FIREPLACE IN SOLIHULL CHURCH.

SIR,—Mr. Bagnall would have made his question somewhat easier to answer if he had correctly described the so-called "mortuary chapel" at Solihull as the old vestry of the church, which it clearly was. Fireplaces in ancient vestries may occasionally be met with, and Mr. Bagnall will find references to several in *Proceedings* of the Society of Antiquaries of London, 2nd S. XIX. 179 and XX. 24; he will also probably find notes of others in the volumes of the *Ecclesiologist*.

Besides their primary use of giving warmth, to the parson or clerk at any rate, such fireplaces were useful for heating charcoal for the censer, boiling water, and divers other purposes for which fire is needed.

W. H. St. JOHN HOPE.

KING'S NORTON SCHOOL COMPETITION.

SIR,—The King's Norton Education Committee have invited architects to submit competition designs for a new school for 1,200 children. The conditions are very objectionable. No premiums are offered; but the conditions state that the accepted design will be the property of the committee (page 8).

Would it not be desirable for architects to abstain from taking part in a competition containing this and other objectionable conditions? Why should there be no premiums?

JAMES TODD.

THE WEST LONDON SYNAGOGUE.

SIR,—It is due to the memory of my lately deceased partner, Mr. Barrow Emanuel, and to myself that you should correct an error in your obituary notice of the late Mr. H. H. Collins in to-day's *Builder*, wherein you state that the West London Synagogue, in Upper Berkeley-street, was the work of Mr. Collins.

It is true that Mr. H. H. Collins competed for that building against the late Fred Cockerell, Wyatt Papworth, and my own old firm of Davis & Emanuel about thirty-five years ago; but he was *not* successful.

The competitive designs were submitted to the late Philip Hardwick, the younger, who recommended ours, and our design was carried out by my late partner and self.

HENRY D. DAVIS F.R.I.B.A. (retired).

Fifty Years Ago.

FROM THE *Builder* OF DECEMBER 29, 1855.

THE timber huts sent out to the Crimea are much complained of. The roofs are not watertight, the sides are not windtight, and the stoves do not give heat enough. At Aldershot there have been two fires in these timber huts. As this is a model camp, we presume the fires were model fires also: a warm look out this cold weather for our men in the Crimea.

The huts in use at Aldershot and in the Crimea have many faults. The framing is clumsy, the boarding is faulty, and when once put up the whole must become mere firewood if removed, as rusty nails cannot be drawn out of thin boards, twisted and warped by sun, rain, and wind. Crimean weather deals with parchment if placed near to it: this ought not to be. The uses of a hut are to afford shelter and protection to the men. There should be means of warmth, means of ventilation, and easy means of removal without destruction.

Illustrations.

DECORATIVE PAINTING: "COMMERCE."

THIS is a monochrome reproduction of the design by Mr. J. H. Amschewitz which gained the Royal Academy prize this year for "Design for the Decoration of a Public Building."

In reference to his intentions in the design, the artist writes:—

"I have endeavoured to convey as realistic an impression as possible, for I think such a subject has its necessary limits, and does not lend itself to a wider margin wherein imagination and allegory have scope. By mass and line in the composition I have sought to express the solid vitality of merchandise applicable to barter and exchange; and by the arrangement have striven, with all due deference, to be guided by the teachings of the Venetians."

LONDON TEMPERANCE HOSPITAL, HAMPSTEAD-ROAD.

THE perspective view we publish shows the buildings as they will appear when the enlargement scheme has been realised. At present the funds will not permit of more than the building of the out-patients' department, consisting of a basement and ground floor, the general arrangement of which is shown on the accompanying plans.

In this department it is proposed to pave the whole of the ground floor with marble terrazzo paving; a dado of the same material will be put round most of the patients' rooms; while the walls of the operating-room will be entirely covered with terazzo of a light-green shade. The remaining wall surfaces will be plastered and painted. The doors in all patients' departments will be Canadian hardwood veneer, flush both sides. The general waiting hall will have ample top light and ventilation, with steel roof trusses and metal glazing bars and patent wired glass. Fire-resisting construction will be adopted throughout.

When the whole scheme is completed there will be accommodation for laboratories, museum, nurses' and students' lecture and recreation rooms, isolation and observation department, porters' apartments, patients' day-rooms in communication with the existing wards, and a new eight-bed ward for female casualty patients.

The casualty patients will be received on the ground floor in the out-patients' department, and taken up by the electric lift provided, and across the bridge on the first floor, and drafted into their respective wards.

The elevations are intended to be in red sand-faced bricks, with Portland stone dressings. The roof will be slated with thick green slates.

The architects are Messrs. Rowland Plumbe & Harvey.

ALL HALLOWS, LOMBARD-STREET.

As a sequel to the measured drawings of this church which we published last week, we now give illustrations of two pieces of decorative furniture included in its fittings, from drawings by Mr. Arthur Kidd, a student of the Royal College of Art.

The Sword-rest.

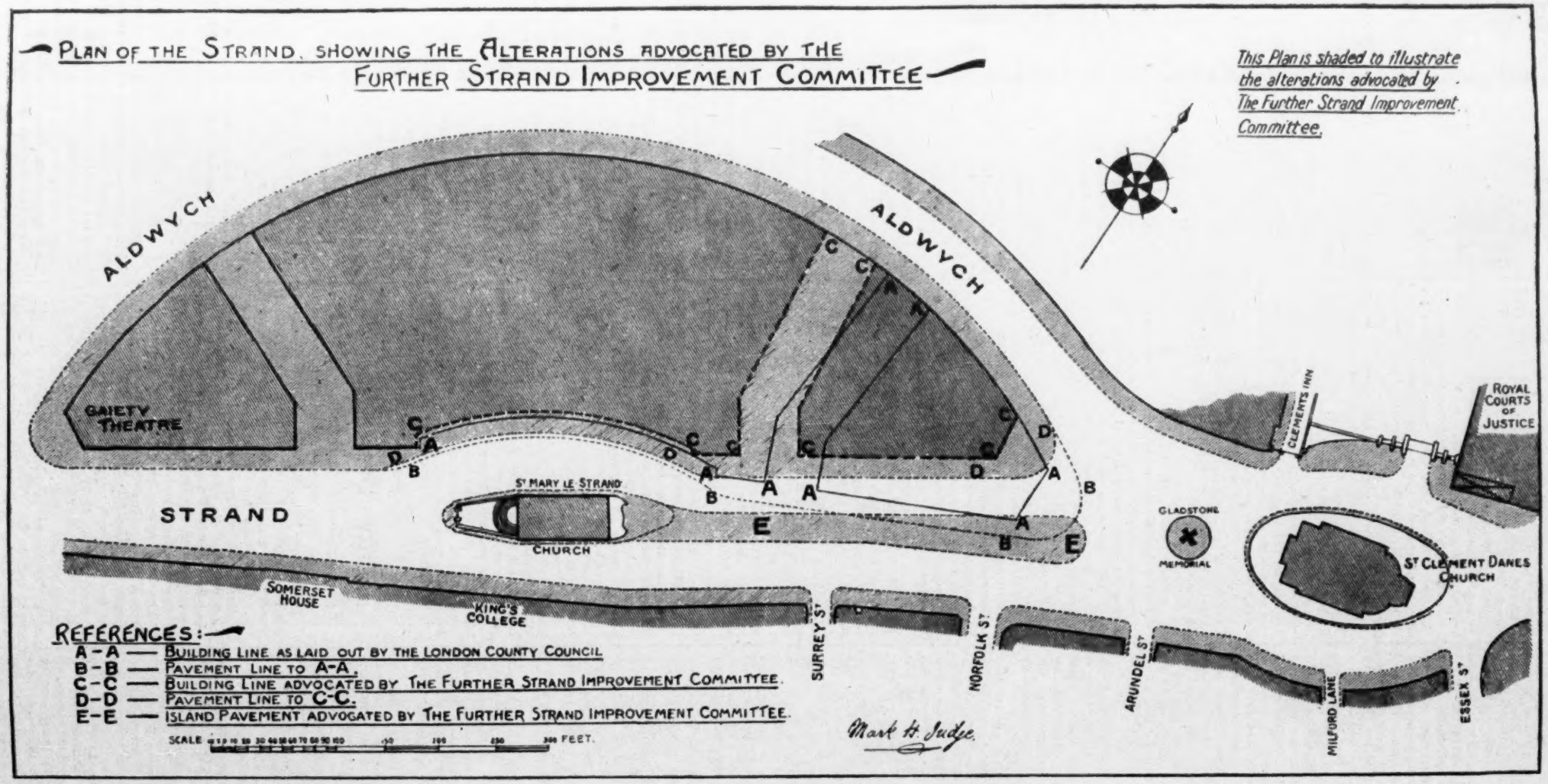
This illustration is reduced from a full-size drawing. The sword-rest was removed from St. Dionis Backchurch to All Hallows in 1878, and is now fixed in the centre of the Corporation pew (see plan previously published). It is of wrought-iron, painted, and gilt. The gilded parts and armorial bearings are original, the remainder of the paint-work modern. The extreme height to the top of the crown is 6 ft. 3½ in.

Upper Part of Font and Cover.

This illustration is reduced from Mr. Kidd's full-size drawing of the upper part of the font and cover. The cover is of ash, and the font itself of white marble. The height of the cover from the lid to the top of the figure group is 3 ft. 8¼ in., and the outside diameter of the font 1 ft. 10 in.

We gave the whole design of the font on a smaller scale last week in a separate illustration in the text; but think it worth while to illustrate the detail on a larger scale.

PLAN OF THE STRAND, SHOWING THE ALTERATIONS ADVOCATED BY THE FURTHER STRAND IMPROVEMENT COMMITTEE


This Plan is shaded to illustrate the alterations advocated by The Further Strand Improvement Committee.
ALDWYCH
ALDWYCH
GAIETY THEATRE
STRAND
ST MARY LE STRAND CHURCH
SOMERSET HOUSE
KING'S COLLEGE
CLEMENTS INN
ROYAL COURTS OF JUSTICE
GLADSTONE MEMORIAL
ST CLEMENT DANES CHURCH
SURREY ST
NORFOLK ST
ARUNDEL ST
MILFORD LANE
ESSEX ST
REFERENCES:
A-A — BUILDING LINE AS LAID OUT BY THE LONDON COUNTY COUNCIL.
B-B — PAVEMENT LINE TO A-A.
C-C — BUILDING LINE ADVOCATED BY THE FURTHER STRAND IMPROVEMENT COMMITTEE.
D-D — PAVEMENT LINE TO C-C.
E-E — ISLAND PAVEMENT ADVOCATED BY THE FURTHER STRAND IMPROVEMENT COMMITTEE.
SCALE
FEET.
Mark H. Judge.

THE NORTH LINE OF THE STRAND.

We give a reproduction of the plan which the "Further Strand Improvement Committee" are intending to memorialise the London County Council to adopt. The plan explains itself, and the reasons for and against its adoption have been referred to in our columns, and are known to most of our readers. The mere abnormal widening of the street at that point would not, in our opinion, have been worth the cost, and therefore we have not supported it. If, however, a garden strip in the centre were included in the scheme, as shown on the plan, this would no doubt be a great public street improvement, but it must be remembered that it means a pecuniary loss to the Council, and eventually to the ratepayers, of considerably over 300,000*l*. Apart from that, we should be very glad to see it carried out in this form, i.e., with a centre space planted with trees. Otherwise it would be a throwing away of money, as the Strand is quite wide enough at that point. It may be urged (as we see Mr. Belcher does in a letter in the *Times*) that the alteration ought to be made in view of the traffic line only, to prevent the traffic going east having to double a headland; but the fact is that, though this looks awkward on the plan, those who are in the habit of frequently passing that way must see that the actual inconvenience to traffic is more imaginary than real.

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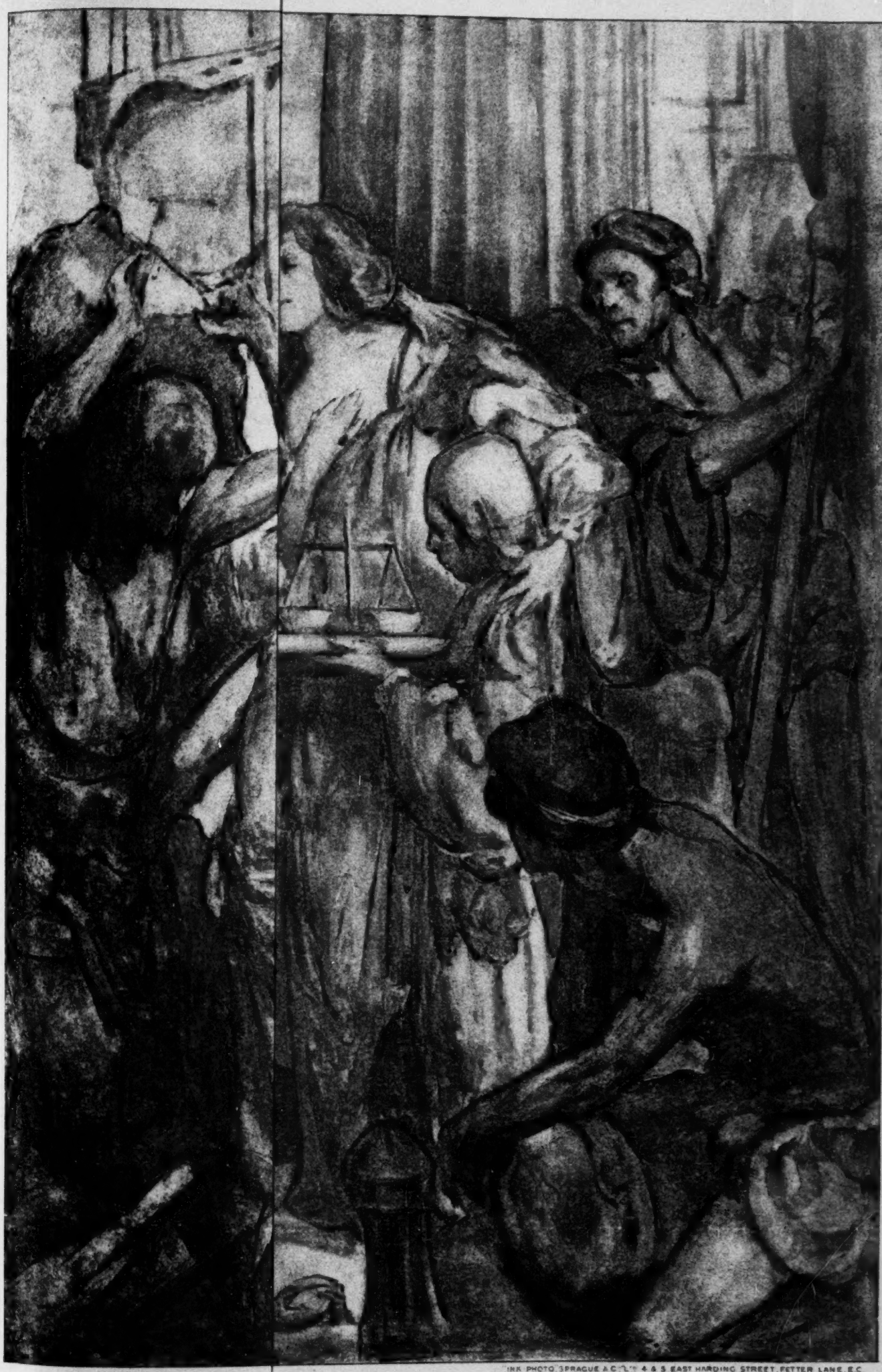
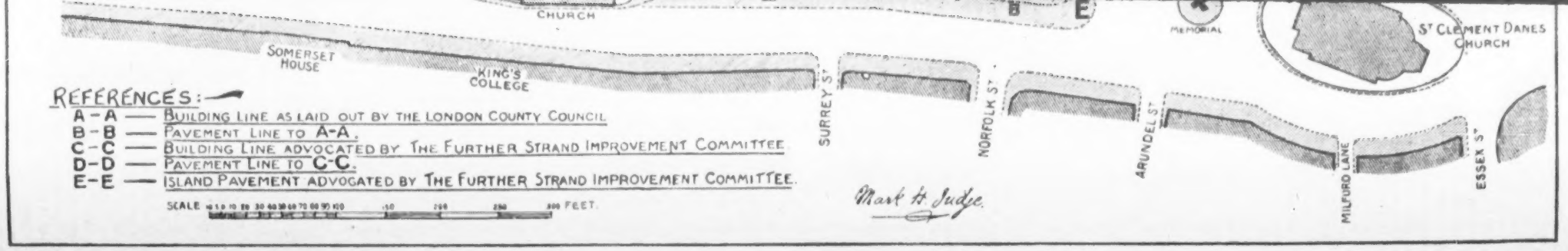


INK PHOTO SPRAGUE & CO. LTD. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

WITZ.

Royal Academy Prize Design, 1905.



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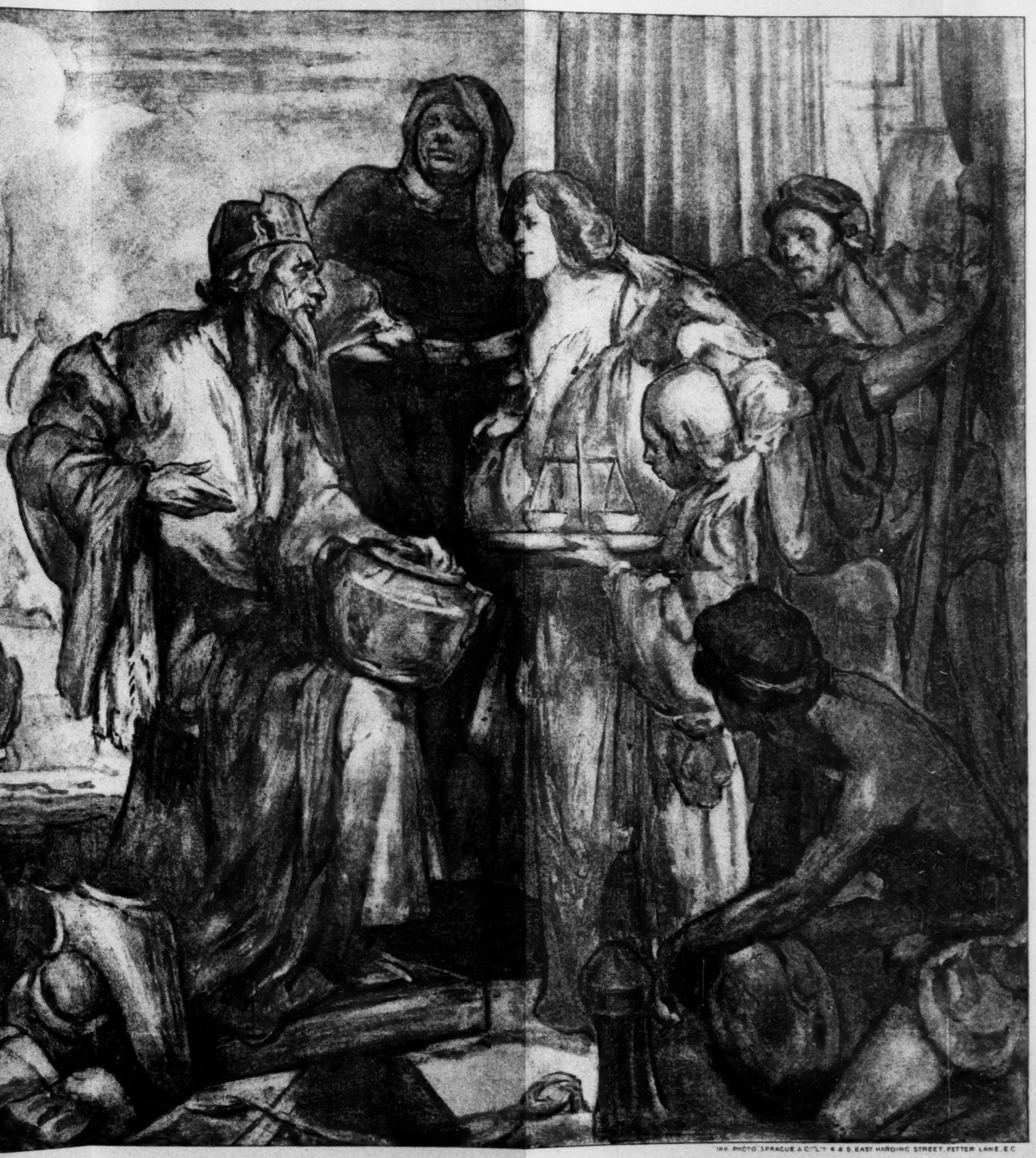
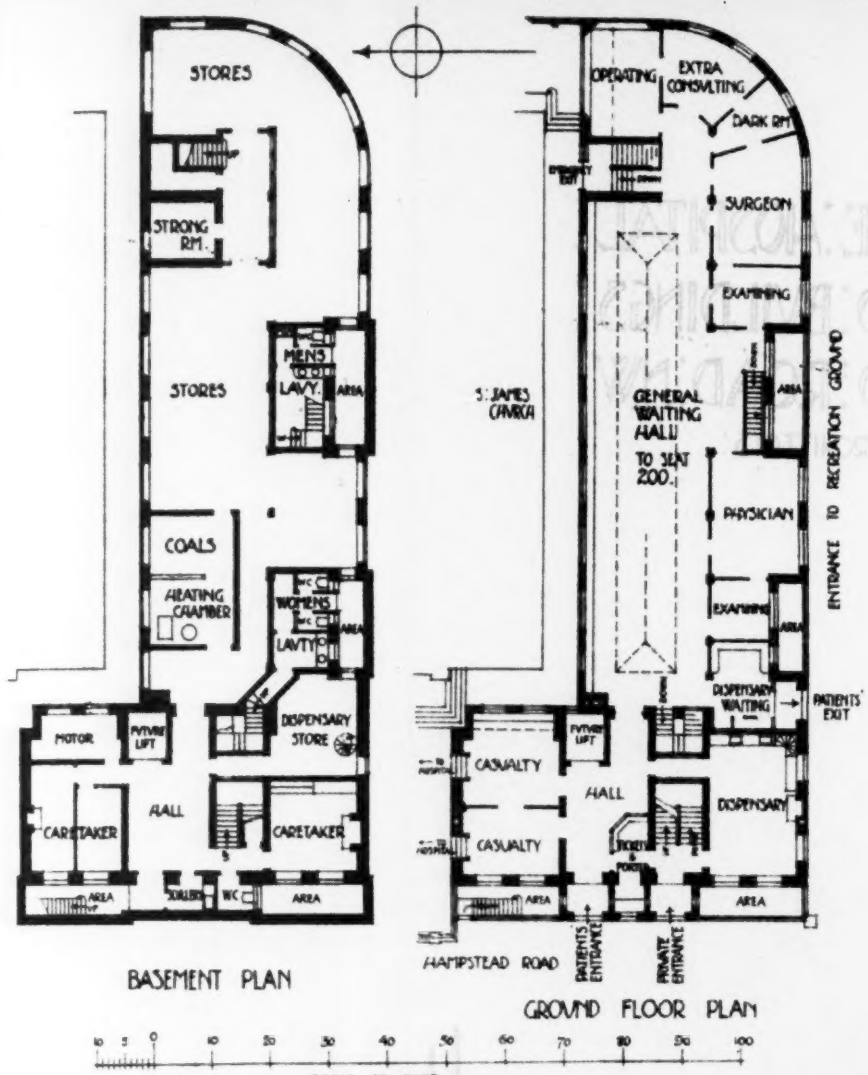


INK PHOTO SPRAGUE & CO'S LTD 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

: DESIGN FOR THE DECORATION OF A PUBLIC BUILDING.—By Mr. J. H. Amschewitz.

LONDO
VIEW
FROM
ROWLAND



LONDON: TEMPERANCE: HOSPITAL:
VIEW: OF: PROPOSED: BUILDINGS:
FROM: HAMPSTEAD: ROAD: N.W.

ROWLAND: PLUMBE: & HARVEY: ARCHITECTS:

PHOTO LITHO. SPRAGUE & C.° LIM.° 4 & 5 EAST HARDING STREET FETTER LANE, E.C.

PLAN OF CROWN LOOKING UP

PLAN OF VANE

SECTION THROUGH CD

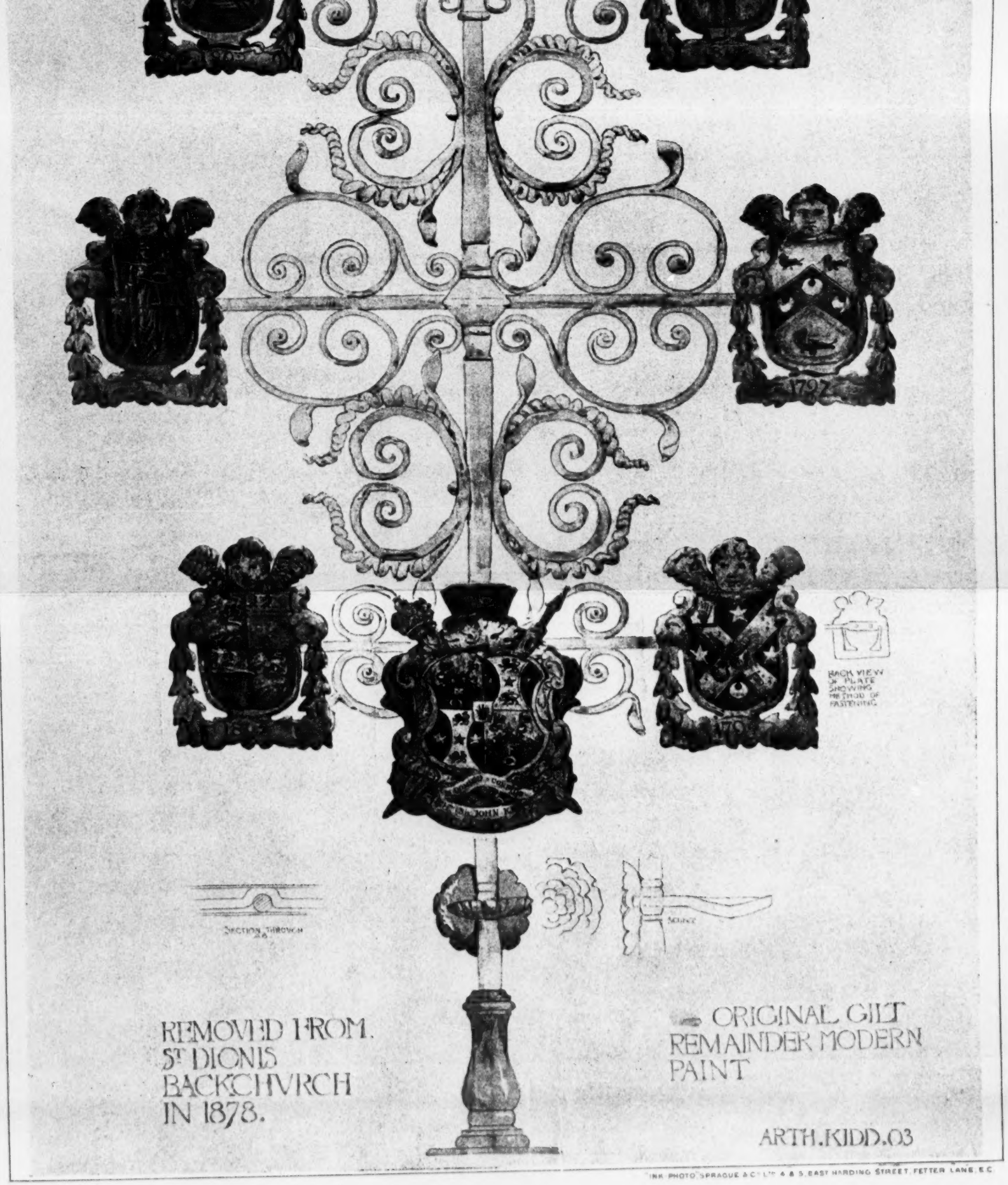
C

E

D

SIDE VIEW OF PLATE CD

ALLHALLOWS LOMBARD ST.
WROVGHT-IRON SWORD-REST



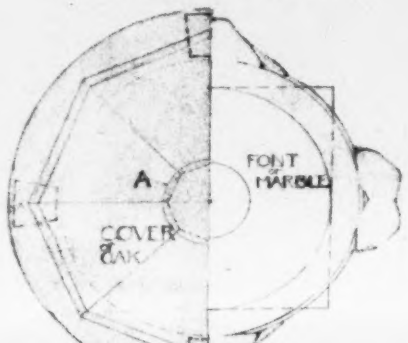
INK PHOTO SPRAGUE & C° LTD 4 & 5 EAST HARDING STREET FETTER LANE E.C.

ALLHALLOWS CHVRCH. LOMBARD STREET DETAIL OF FONT AND COVER

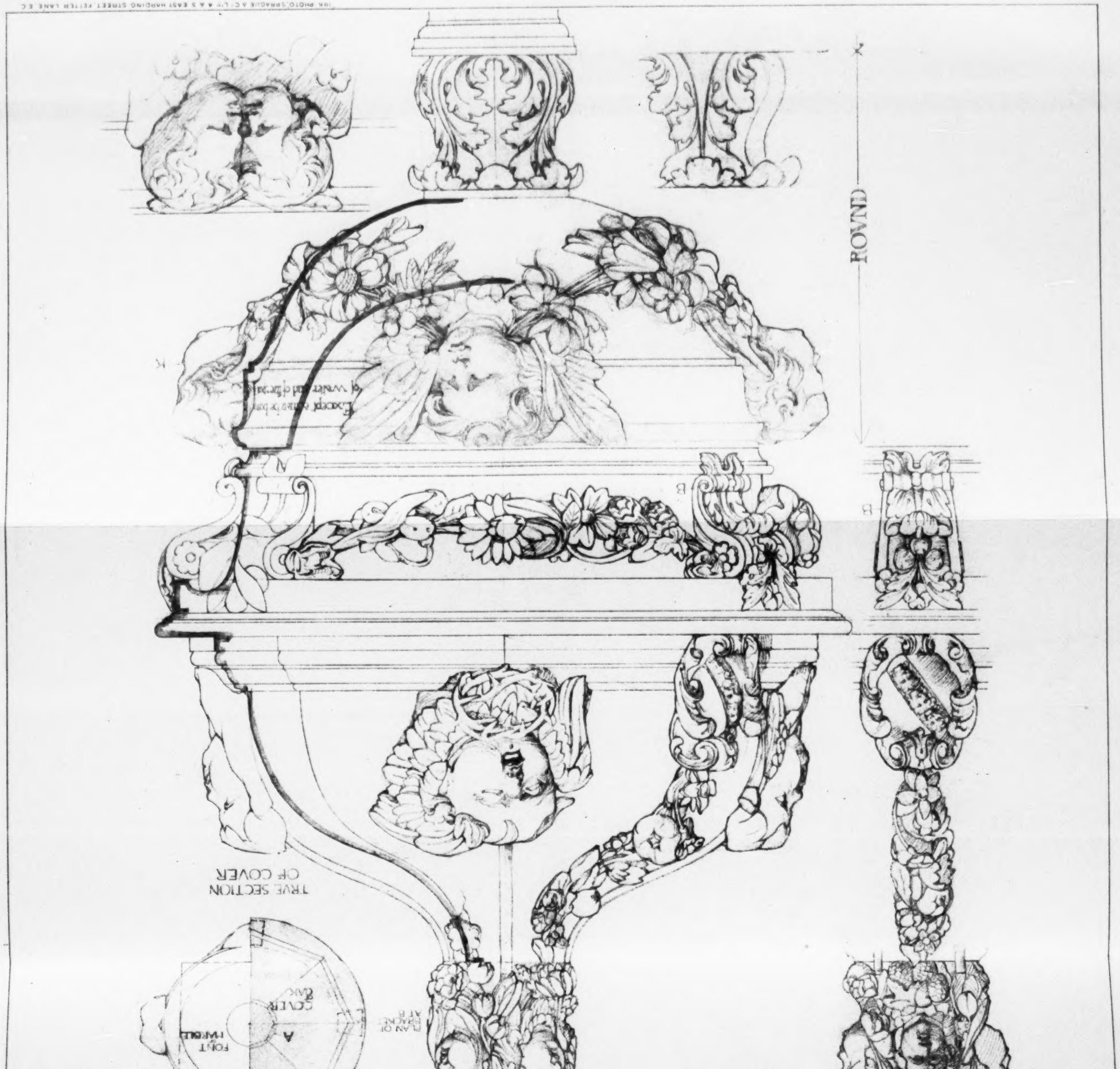
TRVE ELEVATION OF ANGLE

PLAN OF BRACKET AT B

HALF=PLAN HALF=PLAN OF COVER OF FONT



THE PHOTO GRAPHIC CO. LTD. 43 EAST HARDING STREET, FETTER LANE, E.C.



USEFUL WORK FOR THE UNEMPLOYED.

A "Builder and Contractor" writes to us to suggest that if there is one thing more needed than another by the poorer classes it is cheap house room; and in respect of this he makes the following suggestions:—

"Is it not possible to utilise some, at least, of the labour which the unemployed desire to give to meet this want? Although the difficulties which, even on a superficial consideration of this suggest themselves, are many, I do not think they are insurmountable, and if the various questions were debated by a committee, no doubt a workable scheme could be devised.

It would be necessary to provide a supervising body, say, similar to the London County Council Works Department, for it is obvious that, although the manual labour can be done by workers who are being constantly changed, the supervision and management cannot be entrusted to persons of unknown reputation, who are here to-day and gone to-morrow, and whose very needs may make them unscrupulous in representing their qualifications, and whose responsibility would end with their temporary employment.

The first thing to be done is to obtain suitable land at a low price in different parts of London; there are still fields and land to be had in the suburbs. To form roads and sewers much unskilled labour could be utilised; and, although the work could be done cheaper by skilled labour, these suggestions are for the employment of men standing idle. But the helpfulness of this fund will be much lessened in its scope if those employed under it are not strongly induced to get work elsewhere at the first opportunity; at the same time the scheme should not result in lowering the pay of the skilled worker who is in constant employment, and, therefore, the full trade-union rate of wage should be booked to each man according to the trade he works at, but only half or two-thirds should be paid him in cash at the time, the balance being banked for him and payment deferred until some subsequent period of illness or enforced idleness, or taken as part payment of one of the houses should he desire to possess one."

THE POST OFFICE LONDON DIRECTORY.

THE edition of this excellent work for 1906—the 107th edition—has just been issued by Messrs. Kelly's Directories, Ltd. (High Holborn, W.C.). The first impression one has in handling the work and turning over the pages is of its increasing size, for it now contains 3,479 pages, and with the London County Suburbs, which is bound up with the Directory, we have before us 4,631 pages, exclusive of advertisements. The second impression—and that after examination of the contents of the work—is as to the care with which it must have been edited, and the good sense which has ordered its arrangement. The Directory is a model of good arrangement and of accuracy, and the present issue, containing two good maps—the London area and the suburban area—has been brought well up to date (for instance, the change of address of Mr. Paul Waterhouse, announced in the *Builder* on the 9th inst., is included in the useful list of architects given). The scope and character of the Directory are well known to our readers, most of whom must feel that it is an indispensable adjunct to an office.

The publishers can supply the London Directory alone, without the County Suburbs, and they also issue the two together as one or two volumes.

In issuing the Post Office London Directory for 1905 the publishers announced that, in view of the tendency to make the fullest use of the facilities offered by the railways serving the metropolis, and the large number of persons coming to town daily from residences considerably beyond what is known as the suburban area, it had been decided to issue the Directory of the Six Home Counties more frequently. The first volume, containing the counties of Kent, Surrey, and Sussex, was accordingly published in the summer of 1905, and met with such success that it has been decided to issue the companion volume, containing the counties of Essex, Herts, and Middlesex, in the summer of 1906. The two works, which will contain the whole of their respective counties, outside the County of London, will be issued alternately every year.

WESTMINSTER CITY COUNCIL.

THE usual fortnightly meeting of the Westminster Council was held on Thursday, last week, at the City Hall, Charing Cross-road.

Parliament-street Convenience.—The Works Committee submitted a lengthy report respecting the litigation between the Council and the London and North-Western Railway Company regarding the entrance to this convenience in front of the railway company's premises at 35, Parliament-street. The judgment of Mr. Justice Joyce, having been upheld by the House of Lords, the Committee stated that they had negotiated with the railway company and had agreed to pay them the sum of 1,000*l.* as compensation, and also to reduce the length of the railings above ground from 33 ft. 2 in. to 16 ft., which would involve a reconstruction of the staircase affording entrance to the convenience. The Committee further reported having received tenders for the execution of the necessary work, and recommended that the tender of Messrs. Patman & Fotheringham should be accepted. This was agreed to. (The tenders will be found among our usual lists.)

Bursting of Hydraulic Main in Piccadilly-circus.—The Council agreed to make a formal claim against the London Hydraulic Power Company for a sum of 457*l.* 12*s.* 5*d.* in respect of the bursting of this main.

New War Office; Paving.—It was agreed to execute certain paving work in connexion with the dedication to the public of 3,000 ft. super. of land in Whitehall. The cost is estimated at 250*l.*

Clinker-Crushing Plant.—The Highways Committee recommended that the Council should lay down a clinker crushing and screening plant at Shot Tower Wharf, at a cost not exceeding 400*l.* Alderman Emden said that he hoped the Council would expend a sum of not less than 1,400*l.*, as it would enable them to give work to the unemployed. He moved that the report be referred back. Alderman Everett said that the reason that the Committee did not propose to expend more than the 400*l.* was that the Council had only a four years' lease of Shot Tower Wharf. At a future meeting the Committee would be considering the advisability of renewing their lease, and then the matter of the clinker-crusher could come up again. The Council, he admitted, ought to have a dust destructor, but it was no use to think about that until the question of the lease was settled. At the present time the Council was paying 1*s.* 6*d.* per ton to have the clinker barged away, and if they crushed it builders would pay them as much as 2*s.* 6*d.* per ton for the material. After further discussion the Mayor decided that Alderman Emden's amendment to refer back was out of order. The Committee's recommendation was then carried.

Widening of Piccadilly.—On the recommendation of the Improvements' Committee it was agreed to inform the London County Council that the City Council was prepared to undertake the necessary paving and other works in connexion with this widening at an estimated cost, to be borne by the London County Council, of 6,000*l.*, in the case of the improvement between Sackville-street and Piccadilly-circus, and 1,500*l.* in the case of the improvement between Duke-street and St. James's-street, exclusive in each case of the cost of any necessary alterations to companies' mains.

Books.

A Treatise upon the Law Affecting Sewers and Drains, with Plans. By ARTHUR P. POLEY, B.A., of the Inner Temple. (London: Eyre and Spottiswoode. 1905.)

THE object of this treatise, as set forth in the preface, is to elucidate the meaning of the words "drain" and "sewer," and to set forth the statutory and other duties, rights, and obligations of local authorities and private persons in respect to sewers and drains inside and outside the Metropolitan area, and the author states that he has kept in view the requirements of persons outside the Bar, such as, amongst others, architects, surveyors, builders, sanitary inspectors, and owners of property. We must confess we were prepossessed in favour of any treatise consisting of 117 pages, exclusive of the index, which should deal with matters of such complexity, yet of such practical importance to a large number of persons and of everyday occurrence; but the little volume before us, although carefully prepared and brought up to date, well printed and furnished with a good index, lacks clearness in the form in which its subject matter is presented to the reader. A table of contents would have been of assistance in enabling the scheme of the work to be quickly grasped. It is divided into two parts, Part I. dealing with Metropolitan or London County Borough drains and sewers, Part II. with extra Metropolitan drains and sewers under the Public Health Acts; whilst Part III., at p. 42, treats generally of the duties and obligations of local authorities and of occupiers and owners one to another *inter se*, and of the legal machinery to be employed in enforcing and obtaining those obligations and rights. The author has printed the various sections of the statutes referred to in the text with the intention of saving the reader the trouble of referring to an appendix, but this renders the statutes difficult to trace and presents the text in an unattractive form, and there are no side notes to assist the eye. The lay reader requires his legal information presented to him in a highly palatable form, and this volume fails in this respect; whilst the legal profession will probably prefer some of the more exhaustive treatises on this subject. The plans which accompany the volume, however, are of considerable assistance in enabling the reader to master some of the more complicated systems of drainage which have been the subject of legal decisions.

The Law of Light and Air. By ALFRED A. HUDSON and ARNOLD INMAN. Second Edition. (London: Sweet & Maxwell. 1905.)

IN his preface to the second edition of this work the author explains that its publication has been accelerated owing to the change effected in the law of light by the decision in the House of Lords of the case of Colls *v.* the Home and Colonial Stores; but seven years have elapsed since the appearance of the first edition, and the public will welcome a later edition of so excellent a little text-book, which forms what the author expresses the hope that it may do—"a compact digest of the law of light and air for lawyers, surveyors, and students." This preface is dated October, 1905, and the authors state that the volume has been brought up to date, but in the table of cases we fail to find one or two recent cases, such as Kine *v.* Jolly (1905, 1 Ch. 480) and Ambler *v.* Gordon (1905, 1 K.B. 417).

Elementary Electrical Engineering. By J. H. ALEXANDER. (London: Crosby Lockwood & Son. 1905.)

THIS book is intended to be used as a class-book by junior and senior students, and also by working electricians. It is the outcome of a series of lectures on electrical engineering given by the author to an evening continuation class. The author is evidently more at home in describing the practical part of the work of an electrical engineer than in describing theory. In describing the elementary phenomena he has made a few slips, and there are several misprints. He is, however, painstaking, and has successfully simplified the explanation of some of the more abstruse effects of electricity which puzzle beginners. The descriptions of the modern types of lamps and the apparatus used for the generation and distribution of electrical energy are on the whole trustworthy, and the author has in most cases made a good selection by choosing the most instructive types of apparatus. The book is very elementary, and so it forms a useful introduction to more advanced works.

The Inventor's Adviser and Manufacturer's Handbook to Patents, Designs, and Trade Marks. By REGINALD HADDAN, F.C.I.P.A. (London: Harrison & Sons. 1905.)

THIS, being the sixth, edition of a practical and useful manual is published in view of the material changes which have been lately introduced under the Act of 1902 in the examination and issue of patents by the adoption of an official inquiry into the novelty of the invention. Whilst not neglecting the legal and controversial questions involved in the administration of the Patent Acts, Mr. Haddan is mainly concerned with the commercial side of inventions and patents and furnishes inventors, patentees, traders, and others who are interested in patent property with a full exposition of the causes and conditions which contribute to uphold, or to lessen, the value, as apart from validity, of patent rights. The distinction is important,

since the pecuniary value of a patent depends considerably upon the method of obtaining it. Mr. Haddan cites a great variety of reported cases, decisions, and similar authorities for his statements and conclusions. The volume contains a large amount of information about the regulations and procedure which govern the patenting of inventions and the registration of trade marks and designs at home and abroad, and provides copies, in their own several languages and characters, of the prescribed forms.

Motor-Vehicles for Business Purposes. By A. J. WALLIS-TAYLER, A.M.Inst.C.E. With 134 Illustrations. (London: Crosby Lockwood & Son. 1905.)

AT the commencement of this handbook the author remarks that the motor-vehicle as adapted for business purposes "may now be said to have arrived at a state of perfection." This is a very rash statement for an engineer to make. We are quite in accord with the succeeding suggestion that the commercial utility of such vehicles has been sufficiently proved by actual working to place its future on an assured basis. Nearly half the book is devoted to the description of light and heavy passenger cars operated by electricity, steam, oil, and petrol motors, and in the other half is a comprehensive and able summary of light goods vans and heavy freight waggons of the kind that appeal directly to many of our readers. Practically all the best-known types are illustrated and described, and the chapter on "The Cost of Maintenance and Running" is of much practical interest to prospective users.

The Use and Care of Chains for Lifting and Hauling. By HENRY ADAMS, M.Inst.C.E., M.I.Mech.E. (Published by the author. 1905.)

A SERVICEABLE discussion upon an important point of detail will be found in this pamphlet, reprinted by permission of the Civil and Mechanical Engineers' Society, before whom it was read as a paper in 1887. As a matter of fact, Professor Adams performs a little more than is promised by the title, for a fair share of attention is given to the manufacture of chains, due emphasis being placed upon the necessity for sound welds, which have more to do than anything else with the question of reliability. Coming to the maintenance of chains, the author describes in detail the methods proved by his experience to be the most suitable for securing long life and efficiency. Periodical examination, prompt repair on the least indication of defects or excessive wear, regular lubrication—except in the case of hoist chains that are better used dry—protection from dust and grit, and frequent annealing are the chief points of economy in the maintenance of chains, and on these Professor Adams gives some brief practical hints with the substance of which we entirely agree.

Practical Brickwork. Edited by PAUL N. HASLUCK. (London: Cassell & Co., Ltd. 1905.)

THIS volume presents in a handy form the subject matter of a series of articles by Mr. Rufus E. Marsden, originally published in serial form. As a graduated course of instruction in brickwork it should be found of real service to technical students and others. All the chief details of the bricklayer's art are explained simply and clearly, and every chapter contains a considerable number of excellent drawings. The author commences with the bonds in common use, and leads through different forms of work up to the construction of arches and domes. The discussion of the subject is far more complete than that to be found in some works on building construction which cover too much ground to permit the treatment of details in the manner followed by the author of this useful little book.

Johnson's Book-keeping and Accounts, with Notes on Auditing, etc. By GEORGE JOHNSON, F.S.S., F.C.I.S., etc. (London: Effingham Wilson. 1905.)

THE last word has not yet been spoken or written concerning book-keeping, and the student or trader has now a goodly array of manuals and text-books from which to make a selection. Here he will soon find himself in the "advanced" class, but, although possibly sometimes out of his depth, and he will find firm ground by steady application.

Dispensing both with preface and introductory chapter, the author plunges into the subject in the first of the 220 pages to which the work now runs, and proceeds to furnish a wealth of illustration and a plentiful variety of specimen transactions. As indicated in the title, this treatise does not stop short at ordinary commercial book-keeping, but includes such matters as company accounts, bankruptcy, and executorship accounts, and other more complicated business procedure indispensable to the auditor. Nevertheless, much of the information given under the headings named is calculated to be of service to the ordinary investor, the trustee, and others apart from the professions concerned. This is especially noticeable in the case of the section dealing with the book-keeping recommended to executors, in which the disposition of an ordinary estate is followed through the various stages. The dedication of this edition is to "Emile Garcke, Esq., F.S.S., who has done much to maintain for England a foremost place in the application of electricity to traction and other commercial purposes," and who has also, it may be added, himself written upon "Factory Accounts" and kindred matters.

Engineering Standards Committee Report of Progress of Work. (London: Published by the Committee. November. 1905.)

THIS report contains an account of the formation and organisation of the Committee, and states the general nature of the work undertaken by the various sections. Most of this matter is ancient history to readers of the *Builder*, as we have given the substance of it in various references from time to time. Up to July last, nineteen reports have been issued, the numbers sold serving to demonstrate very clearly the relative popularity of the several publications. Dividing these into four main groups we have the subjoined figures:—Structural Steel, 6,270 copies; Portland Cement, 2,330 copies; Pipe Flanges and Screw Threads, 2,024 copies; Railway, Tramway, and Ships' Materials, 1,620 copies; and Electrical Apparatus, 812 copies. The pamphlet concludes with a complete list of the reports issued, with notes setting forth the contents of each, and a list of the standard templates prepared up to the present time. These lists are very handy to intending purchasers for the purpose of reference.

A Handbook of Commercial Law. By F. G. NEAVE, Solicitor. (London: Effingham Wilson.)

THIS is a clear and useful little book for persons who are not lawyers, and gives a capital outline of the law on a number of commercial subjects. The portion most interesting to our readers is probably that on Fire Insurance, in which the law is well summarised.

BOOKS RECEIVED.

KNIGHT'S ANNOTATED MODEL BY-LAWS. Seventh Edition; edited and revised by W. A. Casson. (Knight & Co.)

THE ARCHITECTS' LAW REPORTS AND REVIEW. By Arthur Crow, F.R.I.B.A. (Printed for the author.)

ENGLISH DOMESTIC ARCHITECTURE OF THE XVIITH AND XVIIITH CENTURIES. By Horace Field and Michael Bunny. (Geo. Bell & Sons.)

TRADE CATALOGUES.

WE have received from the British Prometheus Company, Ltd., of Kingston-on-Thames, an interesting illustrated catalogue of their electric heating apparatus. They classify their heating appliances into two groups—radiators and convectors. In the radiator type, large radiator lamps are employed, and the great bulk of the heat energy is radiated outwards, and is absorbed, reflected, or radiated from neighbouring objects. The radiant heat does not appreciably heat the air through which it passes, and hence radiators can be used out of doors, on balconies, etc. In the "convector" or non-luminous type, the resistances are generally embedded in enamel, and their temperature is very much lower than that of the filaments of the heating lamps. The air in contact with the resistances gets warm and rises, and so convection currents are formed in the air. It is claimed that, under normal conditions, this method of heating rooms is much the more efficient. We think, however, that this statement needs modification. Scientifically speaking, the heating will be the same for the same consumption of current. Convector apparatus only localise the heat more in their neighbourhood. Anyone contemplating heating by electricity would do well to write for this catalogue.

We have received from Messrs. R. J. Nicholson & Co., of Cannon-street, Manchester, a series of pamphlets describing small petrol electric-lighting sets. These sets are suitable for the electric lighting of cottages or small houses in the country. For instance, the No. I. set consists of a two-brake, horse-power petrol engine, directly coupled to a small dynamo. The storage battery consists of twenty-seven small cells, capable of maintaining six 16-candle-power lamps or twelve 8-candle-power lamps alight for five hours. Provision is also made on the switchboard so that the dynamo can be connected with the lights directly, and so fifteen or twenty lamps could be burning at once. The whole cost of the power outfit is 70*l.* 10*s.* The recent great improvements which have been made in petrol engines make a miniature electric-lighting set of this nature a possibility, and if someone in the house has an elementary knowledge of mechanical and electrical matters we see no reason why it should not be successful. It would be interesting to know, however, the cost per unit generated of this plant, and whether the fluctuations of the light when the dynamo is running in parallel with the accumulators are appreciable.

The Student's Column.

STEAM BOILERS AND PIPES.—XXV.

THE FLOW OF STEAM (*continued*).

FOR the convenience of readers we have collected in Table XXX. the allowances for the resistance of fittings and valves stated in last week's article.

TABLE XXX.—APPROXIMATE LENGTHS OF STRAIGHT PIPE EQUIVALENT TO PIPE FITTINGS AND VALVES. (*All lengths are stated in multiples of nominal internal pipe diameter.*)

Description.	Screwed Wrought-Iron Pipe.		Flanged Pipe.
	Joints with Square Shoulders	Joints with Reamed Shoulders	Flush Joints and No Enlargement or Contraction of Area.
Bends	4 to 10	4 to 10	4 to 10
Round Elbows	100	50	40
Tee-Pieces	150	75	60
Sockets and Couplings	20	10	—
Valves, Fullway	150	75	60
Valves, Globe	300	150	120

The equivalent lengths representing the various fittings must be added to the length of pipe, the latter measurement including the length of all fittings.

Then the weight of steam discharged per minute with any given loss of pressure can be calculated by formula (63), or the required diameter for a given discharge can be determined by formula (65).

Example (34).—Find the weight of steam at 100 lb. pressure per square inch that can be conveyed with a pressure loss of 1 lb. per square inch through a 2-in. wrought-iron pipe, 100 ft. long, and fitted with one globe valve, five coupling sockets, one round elbow, one bend, and two tee-pieces.

To 100 ft. we add the equivalent lengths given in Table XXX. as follows:—

	Diameters.
One globe valve	300
Five sockets	100
One elbow	100
One bend	10
Two sockets on bend	40
Two tees	300
	850

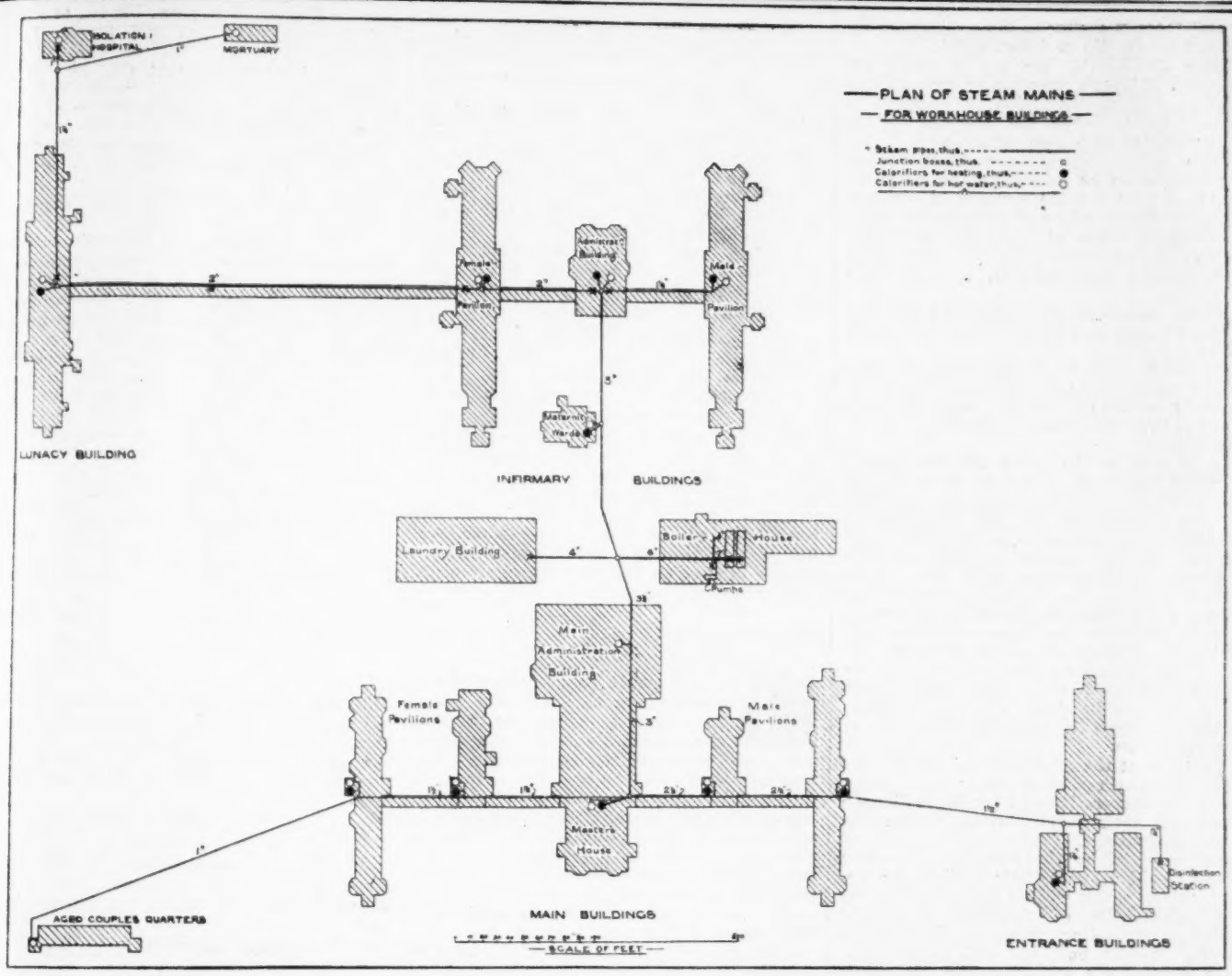


Illustration to Student's Column: Fig. 67.

To find the length in feet of 850 diameters we multiply by the diameter and divide by twelve, thus :—

$$\frac{850 \times 2}{12} = 141{\cdot}66 \text{ ft., say } 142 \text{ ft.}$$

Formula (63) for the weight of steam delivered per minute is

$$W = 60\sqrt{\frac{(p_1 - p_2)\ D\ d^5}{l}}$$

In the present example $(p_1 - p_2) = 1$, by Table XXV. $D = 0{\cdot}2307$, $d^5 = 32$, and $l = (100 + 142) = 242$.

Substituting these values, we have

$$W = 60\sqrt{\frac{1 \times 0{\cdot}2307 \times 32}{242}}$$

$$= 60\sqrt{\frac{7{\cdot}38}{242}}$$

$$= 60\sqrt{0{\cdot}0305} = 10{\cdot}47 \text{ lb.}$$

Example (35).—Find the diameter of a pipe to convey per minute 20 lb. weight of steam at the pressure of 50 lb. per square inch, with a pressure loss of 1 lb. per square inch. The pipe line to be 100 ft. long and provided with the fittings stated in example (34).

Formula (65) for the diameter of the pipe is

$$d = 0{\cdot}2\sqrt[5]{\frac{W^2\ l}{(p_1 - p_2)\ D}}$$

The required values are $W^2 = 400$, $l = (100 + 142) = 242$, $(p_1 - p_2) = 1$, and D, by Table XXV $= 0{\cdot}1202$.

Substituting these values, we have

$$d = 0{\cdot}2\sqrt[5]{\frac{400 \times 242}{1 \times 0{\cdot}1202}}$$

$$= 0{\cdot}2\sqrt[5]{805{,}400}$$

By logarithms the fifth root of 805,400 is

$$\log.\ 5{\cdot}9060 \div 5 = 1{\cdot}1812.$$

The number corresponding with the mantissa ·1812 is 1518, and, by insertion of the decimal point at the place indicated by the index, we get 15·18.

Hence the required diameter is

$$0{\cdot}2 \times 15{\cdot}18 = 3{\cdot}036 \text{ in.}$$

Instead of calculating the results directly, as in the foregoing examples, the required weight of steam discharged (W_1) can be ascertained from Table XXVII. in the manner explained on pp. 624-5, *ante*.

First obtain from Table XXX. the equivalent lengths of the various fittings in terms of pipe diameter, and convert the sum of these values to feet. Add the value so obtained to the measured length of the pipe line, and calculate the value of W_1 by the formula given at the bottom of p. 624, or if the pressure loss differs from that upon which Table XXVII. is based, use one or other of the two succeeding formulæ on p. 625.

To make matters clear we give the following examples, using the assumptions in examples (31), (32), and (33), with the addition of the equivalent length to compensate for fittings, as in example (34). In these, as in the preceding examples, absolute pressures are taken.

Example (36).—Find the weight of steam discharged per minute by a 3-in. diameter pipe 400 ft. long, with a drop of pressure from 60 lb. per square inch to 59 lb. per square inch, and connected with the valve and fittings stated in example (34).

The sum of the equivalent lengths of the various fittings is 850 diameters, and the corresponding length in feet = 142 ft. as before.

Referring to Table XXVII. we find that the weight of steam, at 60 lb. pressure per square inch, delivered through a 3-in. diameter pipe, is 35·30 lb.

Then, denoting the equivalent length for fittings by the symbol l_1, the required discharge will be

$$W_1 = \frac{W\ 10}{\sqrt{l + l_1}}$$

and, substituting the proper values,

$$W_1 = \frac{35{\cdot}3 \times 10}{\sqrt{400 + 142}}$$

$$= \frac{353}{23{\cdot}3} = 15{\cdot}15 \text{ lb.}$$

Example (37).—Find the weight of steam discharged per minute by a 3-in. diameter pipe, 100 ft. long, with a drop of pressure from 60 lb. per square inch to 56 lb. per square inch, and connected with the valve and fittings stated in example (34).

The required discharge will be

$$W_1 = \frac{W\ 10\ \sqrt{(p_1 - p_2)}}{\sqrt{l + l_1}}$$

Inserting values as before, we have

$$W_1 = \frac{35{\cdot}3 \times 10 \times \sqrt{4}}{\sqrt{100 + 142}}$$

$$= \frac{706}{15{\cdot}55} = 45{\cdot}4 \text{ lb.}$$

Example (38).—Find the weight of steam discharged per minute by a 3-in. diameter pipe, 400 ft. long, with a drop from pressure of 60 lb. per square inch to 56 lb. per square inch.

The required discharge will be found by the formula used in example (37), and by inserting the proper values we get

$$W_1 = \frac{35{\cdot}3 \times 10 \times \sqrt{4}}{\sqrt{400 + 142}}$$

$$= \frac{706}{23{\cdot}3} = 30{\cdot}3 \text{ lb.}$$

It is interesting to compare the results in examples (36), (37), and (38) with those in examples (31), (32), and (33), as they show very clearly the important influence of fittings and valves in reducing the flow of steam.

Summarising the most convenient rules and other aids given in the present and preceding articles for computing the diameters of main and branch pipes for the conveyance of steam in ordinary distribution systems, we have the following :—

Formula (63).—Giving the weight of steam discharged per minute through a pipe of any diameter and length, with a given loss of pressure.

Formula (65).—Giving the diameter of a pipe of any length for the discharge of any weight of steam per minute, with a given loss of pressure.

Table XXVII.—From which can be

obtained results similar to those calculated by either formula (63) or formula (65).

Table XXIX.—By the aid of which the diameters of branch pipes can be proportioned roughly, without calculation or reference to Table XXVII., when the diameter of the main pipe has once been determined.

Table XXX.—Giving approximate equivalent lengths to be added to the measured length of pipe for the purpose of compensating for the reduction of flow due to valves and various kinds of pipe fittings. These equivalents can be used in connexion either with formulæ (63) and (65), or with Table XXVII.

Hence, two methods of procedure are open to the designer—(1) by formulæ and (2) by tables.

In every case it is necessary that the weight of steam to be delivered should be correctly estimated for each department of the building or group of buildings to be supplied.

It is outside the scope of the present series of articles to give data as to, and to discuss methods of computing, the quantities of steam necessary for the operation of machinery, the generation of electricity, and for the various domestic purposes of public institutions. Assuming that the reader possesses, or is able to obtain, data of the kind, he will have no difficulty in settling suitable sizes for the different service pipes by the means we have already set forth.

For the purpose of demonstrating the use of the foregoing formulæ and tables we take as an example the steam distribution system in the workhouse buildings, of which Fig. 67 is a block plan.

To arrive at the calculated weight of steam delivered to each point of supply would necessitate the enumeration of all main and branch pipes with their valves, bends, elbows, and other pipe-fittings. The large amount of detail involved by the adoption of such a course would not materially further our present object, which will be amply fulfilled by the consideration of the mains and chief branches proceeding from the boiler-house to the different buildings and departments, with approximate allowances for the valves and fittings.

The following summary of the steam mains shown in Fig. 67 is condensed from the engineer's specification, and will serve as the basis of our computations, the various pipes being distinguished below by numbers to facilitate reference.

Boiler-house.

(1) 7-in. collecting pipe in boiler-house, supplied from one or both of the two Lancashire boilers, each 30 ft. long by 7 ft. diameter.

(2) 4-in. main to electricity generating station.

(2*a*) 1½-in. branch to pump-room.

(3) 6-in. main to junction-box in subway between boiler-house and laundry building.

Laundry Building.

(4) 4-in. main from junction-box in subway to engine-room, with branches to other departments of the laundry.

Infirmary Buildings.

(5) 3-in. main from junction-box in subway to junction-box in subway beneath the administration building of the infirmary, with junction-boxes and branches for steam supply to the maternity wards (1 in.), the administration building (1½ in.), and the male pavilion (1¼ in.).

(6) 2-in. continuation of the main from the junction-box in subway beneath the administration building to a junction-box in the lunacy building, with (1¼-in.) branches for steam supply to female pavilions and lunacy building.

Isolation Hospital and Mortuary.

(7) 1¼-in. continuation of the main from lunacy building to a point outside the isolation hospital, with 1-in. branch to the hospital, and 1-in. branch to the mortuary.

Main Buildings.

(8) 3½-in. main from the junction-box in subway between the boiler-house and laundry building to the administration building, where a 1½-in. branch is taken off for heating and cooking.

(9) 3-in. continuation of the main to a junction-box at the meeting of the subways behind the master's house, where a 1½-in. branch is taken off for steam supply, and whence submains proceed right and left.

(10) 2½-in. submain as far as the second male pavilion, with branches to each pavilion, and a continuation of the submain to the entrance buildings.

(11) 1½-in. submain to the second female pavilion, with branches for steam supply at each pavilion.

(12) 1-in. continuation of the submain past the second female pavilion to the aged couples' quarters, with service branches to each of these buildings.

Entrance Buildings.

(13) 1½-in. continuation of the submain from the main buildings, with 1½-in. branches to the front entrance building and the disinfection station.

Steam is generated in the boiler-house at a pressure of 110 lb. per square inch (125 lb. absolute), and is supplied without reduction to the electricity generating sets.

Beyond the main leading to the latter, the pressure is reduced to 60 lb. per square inch (80 lb. absolute) for distribution, and is further reduced in buildings where steam at lower pressure is necessary.

STEAM BOILERS AND PIPES.—XXVI.

THE FLOW OF STEAM (*concluded*).

HAVING stated the diameters of the steam mains of the system under consideration, and given a plan showing the distances from point to point, we will calculate approximately the weight of steam that can be delivered through each of the pipes, and afterwards compute the same weights by the aid of Table XXVII.

In order to make the results more nearly correct we must allow something in each case for vertical lengths of pipe that cannot be shown on a plan, and appropriate allowance must also be made for valves and pipe-fittings.

The following calculations are made by formula (63) :—

$$W = 60\sqrt{\frac{(p_1 - p_2)\ D\ d^5}{l}}$$

the values of D being taken from Table XXV. directly or by interpolation.

(1) For the 7-in. collecting pipe we take the length at 20 ft., adding an equivalent length of 180 ft. to compensate for valves, separators, and other fittings, and allowing for a drop of pressure from 125 lb. to 124 lb. per square inch.

Then

$$W = 60\sqrt{\frac{1 \times 0{\cdot}2845 \times 7^5}{200}} = 293{\cdot}4 \text{ lb.}$$

(2) For the 4-in. electricity plant main, we take the length at 100 ft., with an allowance of 400 diameters (133 ft.) for valves and fittings, and a drop of pressure from 124 lb. to 123 lb. per square inch.

Then

$$W = 60\sqrt{\frac{1 \times 0{\cdot}2822 \times 4^5}{100 + 133}} = 66{\cdot}79 \text{ lb.}$$

(3) To the point to point length of this main, about 70 ft., add 30 ft. to cover vertical portions and 600 diameters (300 ft.) to compensate for pressure reducing and stop valves, expansion joint, bends, and other fittings. Drop of pressure, say, from 80 lb. to 79 lb. per square inch.

Then

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1869 \times 6^5}{100 + 300}} = 114{\cdot}4 \text{ lb.}$$

(4) The actual length of pipe from the junction-box to the laundry engine-room is about 90 ft., to which 700 diameters (233 ft.) should be added for valves and sundry fittings. Drop of pressure from 79 lb. to 78 lb. per square inch.

Then

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1848 \times 4^5}{90 + 233}} = 45{\cdot}93 \text{ lb.}$$

(5) To the measured length of about 240 ft. add 800 diameters (200 ft.) for junction-boxes, valves, and fittings, and take the pressure loss at (79 − 78) = 1 lb. per square inch.

Then

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1848 \times 3^5}{240 + 200}} = 19{\cdot}17 \text{ lb.}$$

(5*a*) The length of the branch to the male pavilion is about 80 ft.; say, 100 ft., to which add for various valves and fittings 1,350 diameters (140 ft.), the allowance being increased by the fact that this pipe is of wrought-iron with screwed joints and fittings, which cause greater reduction of flow, as shown in Table XXX.

Taking the drop of pressure at (78 − 76) = 1 lb. per square inch.

$$W = 60\sqrt{\frac{2 \times 0{\cdot}1826 \times 1{\cdot}25^5}{100 + 140}} = 4{\cdot}09 \text{ lb.}$$

(6) The continuation of the main in 2-in. diameter to the female pavilion measuring about 100 ft., a suitable allowance for junction-boxes and fittings would be 530 diameters (90 ft.), and the pressure loss may be put at (78 − 77) = 1 lb. per square inch.

The 2-in. continuation of the same main to the lunacy building measures 260 ft. from point to point, the allowance for valves and fittings should be, say, 1,000 diameters (166 ft.), and the drop of pressure from 77 lb. to 76 lb. per square inch.

Then

$$W = 60\sqrt{\frac{2 \times 0{\cdot}1826 \times 2^5}{(100+90)+(260+166)}} = 8{\cdot}26 \text{ lb.}$$

(7) The continuation of the main in 1¼-in. diameter has a length of 170 ft., and it will be sufficient to allow the equivalent of 530 diameters (55 ft.), which, with a drop of pressure from 76 lb. to 75 lb. per square inch will give

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1782 \times 1{\cdot}25^5}{170 + 55}} = 2{\cdot}95 \text{ lb.}$$

(8) The main to the administration building proceeds in 3½-in. diameter for about 70 ft., and, allowing 500 diameters (146 ft.) for valves and fittings, we have, with a pressure drop from 79 lb. to 78 lb. per square inch

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1848 \times 3{\cdot}25^5}{70 + 146}} = 33{\cdot}42 \text{ lb.}$$

(9) The 3-in. continuation of this main measures about 110 ft., and adding 800 diameters (200 ft.) for valves, junction-box, and fittings generally, the discharge, with a drop of pressure from 78 lb. to 77 lb., will be

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1826 \times 3^5}{110 + 200}} = 22{\cdot}70 \text{ lb.}$$

(10) Up to the second male pavilion the right-hand submain, in 2½-in. diameter, has a measured length of about 150 ft. Adding for fittings along the line, and at the two pavilions the equivalent of 1,200 diameters (250 ft.), the discharge, with a drop of pressure from 77 lb. to 76 lb. per square inch, is

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1804 \times 2{\cdot}5^5}{150 + 250}} = 12{\cdot}59 \text{ lb.}$$

(11) The submain on the left hand, in 1½-in. diameter, measures 125 ft. up to the second female pavilion. Allowing the equivalent of 1,200 diameters (150 ft.) for fittings, and a pressure drop from 77 lb. to 76 lb., we get

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1804 \times 1{\cdot}5^5}{200 + 150}} = 3{\cdot}75 \text{ lb.}$$

(12) The 1-in. continuation of the same main from the second female pavilion to the aged couples' quarters has the measured length of about 240 ft. Adding 800 diameters (66 ft.) for valves and fittings, and taking the drop of pressure to be from 76 lb. to 75 lb.

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1782 \times 1^5}{240 + 66}} = 1{\cdot}45 \text{ lb.}$$

(13) The length of the 1½-continuation to the entrance buildings is about 175 ft. To this should be added about 530 diameters (66 ft.) for valves, junction-box, and fittings. Then with a drop of pressure from 75 lb. to 74 lb. per square inch

$$W = 60\sqrt{\frac{1 \times 0{\cdot}1759 \times 1{\cdot}5^5}{175 + 66}} = 4{\cdot}46 \text{ lb.}$$

This completes the mains and submains enumerated in Article XXV., and we will now compute, with the aid of Table XXVII., the weight of steam that can be discharged by each of them. To save unnecessary repetition we refer the reader to the preceding calculations for the lengths, the equivalent lengths for valves and fittings, and the pressure losses.

For the purpose of a rough estimate the progressive decrease of pressure from the boiler to the most distant pipe might be ignored, but for more exact computations the weight of steam discharge should be obtained

from Table XXVII. by interpolation in cases where the discharge is not there given for the exact pressure under consideration.

The simple rule for ascertaining the weight (W_1) of steam discharge for any length of pipe and loss of pressure other than 100 ft. and 1 lb. per square inch respectively, is that as stated on p. 625 *ante* :—

$$W_1 = \frac{W\ 10\ \sqrt{(p_1 - p_2)}}{l}$$

Of course, where $(p_1 - p_2) = 1$, this term can be omitted.

Using this rule in conjunction with Table XXVII., we have the following results for the mains and submains.

(1) $W_1 = \frac{414{\cdot}8 \times 10}{\sqrt{200}} = 293{\cdot}4$ lb.

(2) $W_1 = \frac{101{\cdot}9 \times 10}{\sqrt{233}} = 66{\cdot}76$ lb.

(3) $W_1 = \frac{228{\cdot}6 \times 10}{\sqrt{400}} = 114{\cdot}3$ lb.

(4) $W_1 = \frac{82{\cdot}5 \times 10}{\sqrt{323}} = 45{\cdot}91$ lb.

(5) $W_1 = \frac{40{\cdot}2 \times 10}{\sqrt{440}} = 19{\cdot}17$ lb.

(5A) $W_1 = \frac{4{\cdot}4 \times 10\ \sqrt{2}}{\sqrt{240}} = 4{\cdot}02$ lb.

(6) $W_1 = \frac{14{\cdot}4 \times 10\ \sqrt{2}}{\sqrt{616}} = 8{\cdot}26$ lb.

(7) $W_1 = \frac{4{\cdot}4 \times 10}{\sqrt{225}} = 2{\cdot}93$ lb.

(8) $W_1 = \frac{49 \times 10}{\sqrt{216}} = 33{\cdot}34$ lb.

(9) $W_1 = \frac{40{\cdot}0 \times 10}{\sqrt{310}} = 22{\cdot}73$ lb.

(10) $W_1 = \frac{25{\cdot}1 \times 10}{\sqrt{400}} = 12{\cdot}55$ lb.

(11) $W_1 = \frac{7 \times 10}{\sqrt{350}} = 3{\cdot}74$ lb.

(12) $W_1 = \frac{2{\cdot}5 \times 10}{\sqrt{306}} = 1{\cdot}43$ lb.

(13) $W_1 = \frac{6{\cdot}9 \times 10}{\sqrt{241}} = 4{\cdot}44$ lb.

Comparison of these results shows that they are practically indentical with the discharges calculated by formula (63).

Finally, we can use Table XXIX. for checking the proportions of the mains and submains.

(1) Starting with the 7-in. diameter main, No. 1, which has to supply No. (2) of 4-in. diameter, and No. (3) of 6-in. diameter, we find in the first column of the table that 7 in. = 23,570, that 4 in. = 5,817, and 6 in. = 16,030. As the sum of the two latter values (5,817 + 16,030) = 21,847, a margin of (23,570 − 21,847) = 1,723 is left, which is more than sufficient for the 1¼-in. branch (No. 2*a*) in the boiler-house to supply the pumps, and leaves a margin for the future supply of steam to machinery for operating mechanical stokers and the scrapers of an economiser.

(3) Main No. 3 of 6-in. diameter has to supply, from the first junction-box, No. 4 of 4-in. diameter, No. 5 of 3-in. diameter, and main No. 8 of 3½-in. diameter. The values by the table are 4 in. = 5,817, 3 in. = 2,832, and 3½ in. = 3,461; total = 12,110. By the same table we see that a 5-in. diameter pipe would be too small, and 5½ in., being an unusual size, 6-in. diameter is the most suitable for adoption. Moreover, it provides a margin for future increase of demand.

(5) The 3-in. diameter main (No. 5) has to supply a branch to the maternity wards (1 in. diameter), No. 6 of 2 in. diameter, and branches each of 1¼ in. diameter to the administration building and the male pavilion of the infirmary buildings.

The values of these pipes by Table XXIX. are (181·8 + 1,027 + 314·5 + 314·5) = 1,837·8. As the value of a 3-in. pipe by the same table is 2,832, the diameter adopted appears larger than actually necessary. But, as 2½ in. is an odd size, the adoption of 3 in. is advisable.

(6) No. 6 has to supply a 1¼-in. branch to the female pavilion of the infirmary buildings, and No. 7 of 1¼-in. diameter to the isolation hospital and mortuary.

The values of these pipes by the table are (314·5 × 3) = 943·5, and as the value of the 2-in. branch is 1,027, the diameter seems adequate. It would not be so, however, if the three branches were taken off at the end, owing to loss by friction in the comparatively great length of the main. As the female pavilion is near the commencement, the diameter is suitable.

(8) No. 8 of 3½-in. diameter supplies a 1¼-in. branch to the administration building, and No. 9 of 3-in. diameter. The value of a 3½-in. pipe by the table is 3,461, and the combined value for the other two pipes is (314·5 + 2,832) = 3,146·5. Hence, the diameter is suitable.

(9) No. 9 of 3-in. diameter supplies a 1¼-in. branch to the master's house, a 2½-in. submain (No. 10), and a 1½-in. submain (No. 11). The value for the 3-in. main is 2,832, and the combined value for the pipes supplied is (314·5 + 1,797 + 499·9) = 2,611·4. Therefore the diameter adopted is correct.

(13) No. 13 of 1½-in. diameter has to supply two 1¼-in. diameter branches in the entrance buildings. The value of a 1½-in. pipe = 500, and the value of two 1¼-in. pipes = 629.

Consequently it appears that the main should be increased in diameter. But the demand for steam in these buildings would be easily met by two 1-in. branches, or, at any rate, by one of 1¼-in. and one of 1-in. diameter. The employment of 1¼-in. branches, although in excess of theoretical requirements, is desirable so as to leave ample space for the water of condensation which is relatively greater at the extremities of a steam system. For the same reason, the service pipes for the isolation hospital, mortuary, and aged couples' quarters are of larger area than is called for by theory.

Conclusion.—Much more could be written upon the design of steam-pipe installations, notably upon the strength of pipes for different pressures, the design and application of steam separators, steam traps, and other auxiliaries, the utilisation of exhaust steam-pipe systems for the return of condense water to the boiler-house, and upon many practical details relative to the erection of pipe systems generally.

To treat all these branches of the main subject fully, and to illustrate all the apparatus, fittings, and fixings in an adequate manner would require a separate series of articles. Therefore, in dealing with steam-pipes, as with steam-boilers, we have not attempted to say everything that could be said, but rather to deal with the more important points that come directly within the province of the architect.

OBITUARY.

MR. SETTLE.—The death is announced of Mr. W. Moss Settle, of Barrow-in-Furness and Woodgarth, Ulverston, Lancashire, architect and surveyor, in his 30th year. Mr. Settle was elected an Associate of the Royal Institute of British Architects in 1899, and a member of the Architectural Association in 1897. He made the design for a narrow street front, illustrated in the *Builder* of July 19, 1902. He was architect to the Walney Estates Company, of several houses and business premises in Barrow, the King Alfred Hotel, Vickerstown, and of a cottage contributed to the Cheap Cottage Exhibition recently held at the Garden City, Letchworth. In a competition (February, 1901) limited to local architects Mr. Settle won the third premium with his plans for a large school at Vickerstown for the Barrow School Board. Messrs. Settle & Farmer, of County-square, Ulverston, were the architects of the Bank of Liverpool branch premises at Dalton-in-Furness, Lancs.; the London, City, and Midland Bank branch in County-square, Ulverston (1897-1900); for the rebuilding of the Golden Ball, Dalton (1901); and—in Ulverston—the enlargement of the post-office (1900), additions to "Gawithfield" for Mr. W. F. Egerton, and to "Cark Manor" for Mr. R. W. Wakefield, the lodge for the Joint Hospital Board, stabling, etc., at Todbusk for Mr. F. J. Crossfield, schools at Haverigg, Cumberland, for the Millom School Board, and of cottages at Allithwaite (Upper), Grange-over-Sands. Of the recent work at Ulverston carried out by Messrs. Settle & Brundrit we may mention some houses in Kilner's-park, houses and premises in Clarence-street for the Swarthmoor Co-operative Society, and residences in Settle-street, Millom, and one for Mr. W. Dalgleish at Grange-over-Sands. Mr. Settle was an architect of considerable talent and originality, and we much regret to hear of his early death.

GENERAL BUILDING NEWS.

CATHOLIC CHURCH, HAYDOCK.—The new Roman Catholic Church of the English Martyrs, Haydock, was opened by the Bishop of Liverpool on the 17th inst. The church takes the place of the old school chapel, and has been built to accommodate some 400 persons at a total cost of 1,850*l*. Messrs. R. & L. Lomax, of Platt Bridge, have been the builders, from the designs of Messrs. Curran, of Warrington.

CHURCH RESTORATION, ELLINGHAM.—The re-opening of the parish church of St. James's, Great Ellingham, after partial restoration, took place a short time ago. The floor of the church has been relaid with concrete, tiles, and wood blocks. A new west door of cladded oak outside, panelled and studded inside, has been added with pitch-pine, panelled roof to the vestry, forming a ringers' floor above. The old minstrel gallery has been retained in its original form and re-decorated. The rood screen has been placed in position at the chancel steps. The choir-stalls have been brought to their original position, in the first bay of the nave, and, to harmonise with the colour scheme of the architect, have been painted a dark green. A carved oak pulpit has been erected, and the old altar-table in the Elizabethan style has been renovated and lengthened. The work was carried out by Messrs. Hawes & Sons, Norwich, under the supervision of Mr. Arthur Reeve, of Westminster.

GLASGOW TECHNICAL COLLEGE.—The first section of the new buildings for the Glasgow and West of Scotland Technical College was opened on the 21st inst. The Governors appointed Mr. David Barclay to be their architect, and he has designed buildings which will ultimately consist of five large wings, two parallel to George-street, and three at right angles to them and parallel to Montrose-street. Of these, all except the principal portion of the front wing to George-street, have been completed. The walls facing the streets are of red Dumfriesshire stone; all the other exterior walls are covered with white enamelled brick. The style is a free treatment of Italian Renaissance. The long frontage in George-street, when completed, will have a centre block of three bays, slightly projected, in which will be three arched doorways. The first floor story is 20 ft. in height, and in the centre block is treated with solidity and breadth, forming a base to a columnar façade of columns in pairs, surmounted by an attic story of square, disengaged pillars, upon which is the finishing pediment. The flanking wings are treated as quasi-towers, finished with a balustrade and corner turrets. The same style and character has been adopted in the frontage to Montrose-street, which is 300 ft. long. The frontage to George-street will be 346 ft. long, over 100 ft. in height, and will contain five floors and a semi-basement. The completion of the building as planned will cost about 70,000*l*., and a further expenditure of about 30,000*l*. for equipment is necessary.

BANGOR UNIVERSITY COLLEGE.—At a recent meeting of the council of the University College of North Wales, it was, upon the recommendation of the Plans Committee, resolved to take forthwith the preliminary steps necessary in connexion with the appointment of an architect for the new college buildings. The Council decided that the appointment should be made by a limited competition, a small number of architects being selected to submit designs. In the meantime a public notice will be issued inviting architects desirous of competing to send in their names, though the selection will not necessarily be confined to architects who have actually applied.

NEW INSTITUTE, ABERCYNON.—A workmen's hall and institute has just been opened at Abercynon. The building consists of four lock-up shops on the ground floor, reading-room, committee-rooms, library, games-room, billiard-room, and hall to accommodate 1,150 persons, the gallery having five tiers and a seating capacity for 560 persons. The contractors are Messrs. Williams Bros., of Ynysybwl. The heating, electric wiring, and fire-extinguishing appliances have been provided by Messrs. R. Alger & Son, Newport, and the ventilation and sanitary appliances by Mr. J. W. Wilkinson, Cardiff. The Bath, Forest, and other dressed stone has been supplied by Messrs. Turner & Sons, Cardiff. The total cost of the building will be about 12,000*l*. The architect is Mr. F. Gibson, Pontypridd and Abercynon.

PUBLIC OFFICES, WOKING.—The new offices for the Woking Urban District Council have been practically completed. The building was designed by the District Surveyor, Mr. G. J. Wooldridge, and has been erected by Messrs. Drowley & Co., of Woking, whose contract was for 3,979*l*. The exterior of the building, facing the railway, is in red brick, with Bath stone dressings, and the roof is covered with Broseley tiles. The entrance porch is entirely of stone-work, and there is a balcony above the entrance-hall, 16 ft. by 7½ ft., giving access on the right hand to the assistant overseer's office, and on the left to the clerk's general office, 22 ft. by 18 ft. Behind the latter is the clerk's private office, 17 ft.

square, with strong room in 14-in. brickwork, lined with cement, and fitted with a special door supplied by Milner's Safe Company. In the rear of the building are the surveyor's general and drawing office, 30 ft. by 17 ft., and his private office, 17 ft. by 15½ ft. Communicating with the former, but with a separate entrance from the yard, is a pay office, where the Council's employees will receive their weekly wages without interference with the general work of the department. A small room for samples of materials, etc., submitted by various firms is provided. Also on the ground-floor, besides lavatories, is a telephone exchange. A wide staircase, with teak treads and rises, and oak newells, balusters and hand-rails, leads to the first and second floors. On the first floor, overlooking the road, are a committee-room, 21 ft. by 18 ft., and the sanitary inspector's office, 18 ft. square, with a waiting room 15 ft. by 7½ ft., between the two, and giving access to the balcony. The rear of the building on this floor is entirely taken up by the Council chamber, 40 ft. by 30 ft. It is lighted on three sides by means of five windows, the artificial illuminant being electricity—as throughout the building—supplying four electroliers and five wall brackets. In common with the other rooms, it will be heated by slow combustion open grates. The accommodation on this floor is completed by a cloak room and lavatories. On the second floor is a room, 40 ft. by 18 ft., which can be used for meetings of committees and other semi-public bodies not directly connected with the Council. Then there are the caretaker's quarters and a clock-chamber.

POLICE AND FIRE STATION, EDINBURGH.—Edinburgh Dean of Guild Court met on the 14th inst. There were fifteen applications before the court. Five warrants were granted, and an equal number of cases were remitted to the Burgh Engineer. The city authorities were granted warrant to take down 21 to 27, Saunders-street, Stockbridge, and to erect a police and fire station there. The site has been acquired by the city, and the proposal is to build a district police and fire station, with rooms in the upper stories for the staffs of these departments. The fire station will consist of an engine hall, with duty and recreation rooms. In the meantime it is proposed to provide stabling for horses in connexion with the fire engines. That accommodation will be dispensed with if it should be decided to use motors instead of horse-drawn fire engines. The police station will consist of a charge office, witness room, sergeants' and superintendent's room, muster room, and five cells. In the rear a workshop has been provided for the fire department, with an ambulance shed for the police. The whole block will include eleven dwelling-houses for the two branches of the service, and will be four stories in height. Estimates have been accepted to the extent of 7,798*l.* on the plans prepared by the City Architect's Department.

THE BRADFORD CHEAP COTTAGE BUILDING SCHEME.—A Buildings Sub-committee of the Bradford Corporation, under the chairmanship of Mr. A. Gadie, had before them on the 13th inst. the scheme of Messrs. Mawson & Hudson, architects, for the building of cottage property on a design the object of which was to effect economies in the building of this kind of dwelling and to make the residences more attractive. Two plans were presented, showing alternate designs, and the promoters of the scheme asked for an expression of opinion upon them from the Buildings Committee. The houses were to have rubble walls, faced with cement rough cast; there were to be no outbuildings; the roads were to be narrower and, except in thoroughfares or main streets, asphalted instead of paved with setts; and there were to be gardens back and front. The sub-committee were unable to entertain the scheme on account of the insufficient road space proposed to be allowed, this falling short of the minimum stipulated in the by-laws. It was felt to be undesirable to endeavour to obtain an amendment of the by-laws, those at present in force being regarded as more favourable than the model by-laws of the Local Government Board.

FREE LIBRARY, PRESTONPANS.—A new free library has been opened at Prestonpans. The building consists of a reading-room, recreation-room, and book-room, with librarian's house adjoining. Mr. James P. Alison, architect, Hawich, prepared the plans for the work, the total cost amounting to 1,500*l.*

FREE LIBRARY, THORNE.—The foundation-stone of a new public library was laid at Thorne on the 14th inst. When completed the building will comprise on the ground floor an entrance-hall, with a lending library capable of storing 20,000 volumes, a librarian's room, and a news-room. On the first floor will be a magazine-room, reference library, and a ladies' room. Annexed is a caretaker's cottage of five rooms. The building will be faced with Nostel bricks, with dressings of Ancaster stone. The total cost, including furnishing, will be 1,500*l.*, and the architect is Mr. E. H. Ballan, of Doncaster, the contractor being Mr. William Barton, of Thorne.

PROPOSED HOSPITAL EXTENSIONS, WALKER GATE.—On the 14th inst. Dr. R. Deane Sweeting held an inquiry at the town hall, Newcastle, into an application by the Newcastle Corporation for sanction to borrow a sum of 45,000*l.* for the extension of their infectious Diseases Hospital at Walker Gate. The Town Clerk said tenders had been obtained, and subject to consent being obtained to borrow the necessary money, the tender of Messrs. J. Parkinson & Sons, Ltd., Newcastle, had been accepted at the price of 39,720*l.* To this must be added the cost of furnishings, construction of sewer, and provision for expenses and contingencies, which would bring up the total estimated cost to 45,000*l.* It was proposed to increase the accommodation from 105 beds to 169, an addition of 64 beds. Mr. Holford, the Property Surveyor, explained the plans and the general scheme. It comprises the erection on a further portion of the Walker Estate of two new pavilions, a nurses' home, additions to the present isolation block, and several necessary alterations to the administrative block and other parts of the building. All the buildings are of the same character as those at present existing.

BUILDING AND IMPROVEMENT SCHEMES, DONCASTER.—The Doncaster Corporation have, according to the *Sheffield Telegraph*, three schemes on hand and in process of development which will entail in the near future an expenditure of fully 50,000*l.* One enterpise consists of the widening of Chequer-lane and the erection of a set of elementary schools in that district, the former being essential to the carrying out of the latter, and the joint cost will amount to 20,000*l.*—2,000*l.* being for the widening of the road, and 4,000*l.* for the cost of the site of the schools. The full scheme provides for an educational establishment for 1,460 children—540 boys, 380 infants, and 540 girls; but in the first instance it is only proposed to proceed with the boys' school, which will entail an expenditure of 5,000*l.*, or, counting the cost of the site, a sum of over 9,000*l.* Another scheme is the erection of a model lodging-house in Fishergate at a cost of 6,250*l.*, 5,000*l.* being for the buildings, and 1,250*l.* for the site. It will contain accommodation for 126 persons, male and female. The other scheme has to do with the municipal technical school and the girls' secondary school. The Education Authority propose to build a new municipal technical school and a girls' secondary school, the estimated cost of which, exclusive of the site, is 14,500*l.*, and to this must be added 5,000*l.* for the equipment, making a total of 24,000*l.* It has been decided to erect these new buildings on the south-east side of St. George's Church, with a frontage to Gray Friary-road and Church-view. One building will be used as a secondary school, and the other for engineering work. The plans are being prepared by Mr. W. H. R. Crabtree, the Borough Surveyor, and a commencement will probably be made early in the coming year.

CO-OPERATIVE PREMISES, BEDLINGTON.—New premises have been built by the Bedlington Co-operative Society at Bedlington. The work has been carried out from the plans of Mr. T. Tulip, of Choppington, at a cost of about 4,000*l.*

THEATRE, STOCKTON.—The new Hippodrome Theatre, which has been erected at Stockton, was opened on the 18th inst. The building provides accommodation for 2,300 persons, and has cost about 14,000*l.* Messrs. George and Robert Nicholson were the builders, and Mr. W. Hope, of Newcastle, the architect of the work.

SOLDIERS' AND SAILORS' HOME, PIMLICO.—A new wing is in course of being built at the Home in Eccleston-street, S.W., and the scheme for extension comprises accommodation for 50 more bed-cubicles, a lecture hall with 400 seats, recreation-rooms, and an enlargement of the kitchen and refreshment bar. The trustees bought and adapted the existing buildings at an outlay of 12,000*l.*, their former premises in Buckingham Palace-road having been acquired for the extension of Victoria Railway Station. Mr. Robert Curwen is the architect of the additional wing.

CHARING CROSS RAILWAY STATION.—It is announced that the contract for removing the roof and for the work of rebuilding will be given to Messrs. Andrew Handyside & Co., Ltd., of Derby, and that upon the advice of Sir Benjamin Baker and Sir John Wolfe Barry, in consultation with Mr. Tempest, engineer to the company, the directors have resolved to replace the present roof with one after a more modern kind and at a lower level, which will moreover facilitate any future widening of the terminus. The engineers recommend that by way of precaution the feet of the principals should be united with steel hawsers during the removal of the roof. It is anticipated that the new works will be completed in the course of seven or eight weeks, so far as to admit of the station being re-opened.

MEMORIAL HALL, ELSON.—A new parish hall has been erected midway between Elson and Hardway. The building is of brick, and was designed by Mr. Mount, of Staple-inn. Messrs. C. J. Lear & Son, of Alverstoke, were the builders.

STAINED GLASS AND DECORATION.

ST. PETER'S CHURCH, BETHNAL GREEN.—The Church of St. Peter, Bethnal Green, was re-opened on Monday, the 18th inst., after undergoing thorough repair. A new vestry for the clergy has been built on the north side of the chancel. Carved oak screens have been erected on each side of the choir, that on the north side forming a choir vestry and the screen on the south side encloses the lower part of the organ. A low screen of marble with marble steps has been added to the chancel, and portions of the nave are laid with tesselated pavement. A new octagonal pulpit of carved oak has been erected next the chancel screen, and a new marble font takes the place of the old one. New wrought-iron gas brackets and standards have been supplied by Messrs. Stroud. The roofs, walls, and seats have been repainted. The arch and ceiling to the sanctuary have been decorated, and above the arch are four angels bearing scrolls and texts. The subject of the Adoration of the Magi occupies the three panels of the arcading above the altar, and upon either side are figures of SS. Peter and Paul, the other panels representing a conventional treatment of the vine. The decoration of the sanctuary has been executed by Messrs. Heaton, Butler, & Bayne. A great improvement has been effected by the removal of the galleries which crossed the centre of the nave windows, and the nave has been enlarged by taking down a partition which enclosed a staircase to the galleries at the west end of the church. The work, including the decoration round the nave windows, has been carried out by Messrs. F. & A. Willmott, of Ilford, under the direction of Mr. John Medland, architect, of London.

WINDOWS, ST. PATRICK'S CATHEDRAL, DUBLIN.—At St. Patrick's Cathedral a memorial has been erected to the late Dr. Salmon. The memorial comprises two windows of painted glass (by Mr. C. E. Kempe) descriptive of scenes in the life of St. Peter, and a medallion portrait of the late Provost by Mr. Albert Bruce-Joy, R.H.A. The medallion is in bronze and is surrounded by a framework in the same metal, which has been designed by Sir Thomas Drew, R.H.A. Beneath is a bronze tablet, upon which a Latin inscription in raised letters has been placed. The memorial is placed in the Chapel at the end of the north choir. The stonework of the memorial was carried out by Messrs. Sharpe & Emery.

APPOINTMENT.

DUNDEE.—Mr. J. H. Langlands, who since 1886 has acted as architect to the Dundee School Board on an *ad interim* appointment, has been officially selected as the architect and measurer for the Board.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, ALFRETON.—Mr. W. H. Radford, C.E., of Nottingham, has submitted to the Alfreton Urban Council a report as to the best means of improving their present water supply. He estimates they require about 200,000 gallons a day, including the water sold to the Midland Railway Company. The cost of making extensions at Lindway No. 1 Reservoir would be about 1,512*l.* per 1,000,000 gallons, whereas at Butterley it would cost 1,652*l.* per 1,000,000 gallons. At Butterley only 5,000,000 gallons could be stored, while at Lindway 11,000,000 gallons could be stored extra. The Lindway No. 1 Reservoir would have to be reconstructed, with the addition of filter beds. The 7-in. supply main was altogether too small. He suggested that a new 9-in. main should be laid by the side of the old one, which would cost 5,309*l.* This would avoid the necessity for pumping at Cotes Park. The following are his estimates: Reconstructing Lindway No. 1 Reservoir, to hold 16,000,000 gallons, 15,880*l.*; new 7-in. main between Butterley and Lindway reservoirs, 1,430*l.*; filter beds, 840*l.*; clear water reservoirs, to hold 100,000 gallons, 1,200*l.*; new 9-in. main from Lindway to Cotes Park, 5,300*l.*; total for works, 24,650*l.* Mr. Radford deals with the proposal to increase the storage at the Butterley reservoirs, the cost of which he estimates to be 12,560*l.*

SEWERAGE SCHEME, STRETTON.—The new sewerage works at Stretton have now been completed and opened. Messrs. Mansergh & Son were the engineers, the contractor being Mr. W. Morley, and the total cost has been about 12,000*l.*

WATER MAINS, PENZANCE.—Col. A. G. Durnford, R.E., representing the Local Government Board, held an inquiry at the Guildhall, Penzance, on Wednesday, last week, into the application of the Corporation to borrow 4,500*l.* for the purposes of laying new water mains from the reservoir to certain parts of the town. Mr. T. H. Cornish (town clerk) explained the object of the application. The population of the district, he said, which would be supplied by water was 13,136 at the last census; the assessable value was 59,038*l.*; the balance of the outstanding loans 46,610*l.*; the area 472 acres; and a 1d. rate would produce 225*l.* The application was to

borrow 4,500*l.* for thirty years for the purpose of laying new mains from the reservoir to the town. At present water was brought in by two mains connected with the high-level reservoir for supplying the higher district of the town, and another main for supplying the central and lower parts of the town. Since these mains were laid extensive building operations had been carried on on both sides of the town, and the mains had not allowed the residents to have the fullest supply of water. They believed that this occurred through the corrosion of the pipes, and it was thought that the 9-in. main now only allowed the diameter of 7 in. It was now proposed to lay a new 12-in. main from the reservoir to the bullock market. It was not proposed to disturb the existing line of pipes. Mr. F. Latham (Borough Surveyor) gave details of the proposed scheme.

PROPOSED PONTOON DOCK, ABERDEEN.—The Aberdeen harbour engineer, Mr. R. Gordon Nicol, has prepared a report to the Docks and Pilotage Committee on the propriety of providing another pontoon dock for the accommodation of fishing and other vessels at the port. The site which best fulfils the necessary requirements is to be found in the immediate vicinity of the existing dock at Albert Quay. At this place there can be obtained deep water berth outside the quay wall, suitable for the reception and working of a new dock, without further expenditure on constructional work than is required for the attachment of the dock to the quay wall. Taking current prices of materials into account, the cost of the dock complete, attached to the quay wall and fitted up ready for work, would be about 10,860*l.* The cost of constructing the timber jetty and dolphins would amount to about 6,990*l.*, based on prices for this class of work when executed departmentally. Mr. Nicol recommends that the whole of the work be executed by contract. The new scheme could, in his opinion, be brought into working order before the end of 1906, and would represent a capital outlay of 26,778*l.*

FOREIGN.

FRANCE.—The Government of the United States have given to the City of Paris a subvention of 250,000 dollars in consideration of the erection of the American National Institute on ground belonging to the Municipality.——M. Alphonse Gosset, architect, of Reims, has submitted to the Municipal Council of Paris a scheme for a "Théâtre Populaire" to contain 4,000 spectators. This establishment, which it is proposed to erect on the site of the old Marché du Temple, is proposed to be in a semi-circular form with all the seats in steps. On each story there are to be three foyers, eight staircases and nineteen doors, assuring a speedy exit on to an arcaded gallery running all round the building. The cost is estimated at 4,000,000 francs.——A monument to the memory of Corneille is to be erected in Paris, from the designs of M. Allouard (sculptor) and M. Latour (architect). It will be composed of a bronze portrait statue of the poet, with, at the base of the pedestal, two other figures, one symbolising "Tragedy," and the other representing Rodrigue, the well-known character in "Le Cid."——The Government is about to establish a school of naval engineering, and a naval magazine, on the portion of the Champ de Mars bordering the Avenue Suffren, near the Eiffel tower.——It is proposed to erect at Calais, by subscription, a monument to the memory of Jacquard, the eminent mechanician, and inventor of the loom which bore his name.

SOUTH AFRICA.—The Duke of Connaught is to be invited to lay the foundation-stone of the new municipal buildings in Durban during his visit to Natal in February next.——Three new schools are to be erected in King Williams' Town.——The Standard Bank buildings in Maritzburg have been practically rebuilt by Messrs. Cromwell & Carter, the architects who designed and supervised the work being Messrs. Stott & Kirkby.——The Natal Government Railways invite tenders for the erection of buildings of brick and wood and iron on a portion of the Natal-Cape Railway between Donnybrook and Dronk Vlei.——A chapel to the memory of the "old boys" of St. Andrew's College, Graham's Town, who fell in the South African wars between 1877 and 1902, is to be built in Grahamstown. When completed the building will cost 7,600*l.*

GERMANY.—The new theatre at Halberstadt, built from designs by Herr B. Sehring, at a cost of 500,000 marks, was opened on October 1.——Professor Reauleaux, engineer, who was for many years professor at the Technical Schools at Charlottenburg, died recently in his seventy-sixth year at Charlottenburg.——The new theatre at Nuremburg, designed by Herr Seeling, was opened on September 1; the building is intended to accommodate an audience of 1,422 persons.——The architects of Munich have lodged a protest against the monotonous rows of houses that are being erected in their town; they suggest that the houses should no longer be built absolutely parallel with the line of the street, but that each house should have an individuality of its own, within certain prescribed limits.——The memorial at Nuremburg to the Emperor William I. was unveiled on November 13; the memorial, which is in the form of an equestrian statue, is the work of Professor von Ruemann and Herr Hans Grässel.

MISCELLANEOUS.

PROFESSIONAL AND BUSINESS ANNOUNCEMENTS.—Mr. George Waymouth, architect, has removed his offices from 23, Moorgate-street, to Raymond House, Theobald's-road, Gray's Inn, W.C. Telephone number, 4,867, as before.——Mr. W. F. Harber, architect, has removed from 11, King's-mansions, Cheyne-walk, to 1, Lampard House, Royal Hospital-road, Chelsea, S.W.——Mr. W. Hoffman Wood, surveyor, has removed his offices from 14, Park-square, Leeds, to 8, Queen-square, in the same city.

SLATE TRADE.—Prices for the coming year have now been fixed at all the quarries, and show reductions of from 10 per cent. to 20 per cent. Objections were raised to some of these reductions, but it is generally believed to be best for the trade, and that the "bedrock" of prices has now been reached; also that merchants can now get good, sound Welsh slates to compete successfully with the inferior foreign and colonial slates which have been put on the market the last few years.

FLOODS PREVENTION SCHEME, MIDDLESBROUGH.—For many years past serious inconvenience and loss have been experienced in certain parts of Middlesbrough situated on the low-lying marshlands at the mouth of the Tees. In 1895 Mr. Frank Baker, the Borough Engineer, made an unsuccessful endeavour to persuade the town council to establish a pumping station for alleviating the flooding of the Marsh-road district. Since that date the town has increased considerably, many hundreds of houses having been erected, and an enormous volume added to the sewage. To show the extent of the floods taking place in the district, it may be stated that in December, 1901, the area flooded was between ten and eleven acres, and contained more than three hundred houses, the quantity of water in that particular flood being equal to 307,000 cub. ft., or practically 2,000,000 gallons. After the Council had decided to proceed with the floods prevention scheme some difficulty was experienced in finding a suitable site near the required point. Ultimately a plot of land was obtained upon which an engine-house has been built and equipped with pumping plant capable of delivering 15,000 gallons of water per minute through a lift of 16 ft. These works only form a portion of the general scheme for alleviating the flooding of the district, and during the heavy rains which took place in October and November last the machinery performed valuable service, the maximum quantity pumped during the week ending November 18 being upwards of 25,000,000 gallons. It is unfortunate that the town council did not accept the recommendation that the second pair of engines and pumps should be laid down at the same time, because, useful as the existing plant may be, its capacity is scarcely sufficient for dealing in a thoroughly satisfactory manner with exceptionally heavy floods.

CHURCH BUILDING SOCIETY.—The Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels held its usual monthly meeting, on the 21st inst., at the Society's house, 7, Dean's-yard, Westminster Abbey, S.W., the Rev Canon C. F. Norman in the chair. Grants of money were made in aid of the following objects, viz:—Building new churches at Beckton, S. Michael, East Ham, Essex, 120*l.* for the first portion; Knaphill, Holy Trinity, near Woking, 80*l.*; Roker and Fulwell, S. Andrew, near Sunderland, 150*l.*; and Heigham, S. Barnabas, near Norwich, 180*l.* in lieu of a former grant of 105*l.*; towards rebuilding the Church of St. John, Curbridge, near Witney, Oxon, 45*l.*; and towards enlarging or otherwise improving the accommodation in the churches at Bottisham, Holy Trinity, near Cambridge, 45*l.*; Gloucester, S. Luke, 10*l.*; Hereford, Holy Trinity, 70*l.*; Monewden, S. Mary, near Framlingham, Norfolk, 25*l.*; and Barnes, S. Mary, Surrey, 100*l.* in lieu of a former grant of 75*l.* A grant was also made from the Special Mission Buildings Fund towards building a mission church at Hextable, Swanley, Kent, 30*l.* The following grants were also paid for works completed:—Prestatyn, Christ Church, Flints, 30*l.* on account of a grant of 55*l.*; Lakenheath, S. Mary, Suffolk, 20*l.* on account of a grant of 40*l.*; Hucknall Huthwaite, near Mansfield, 40*l.*; Luton, S. Saviour, Beds, 145*l.*, making in all 275*l.*; S. Columb Major, S. Columba, Cornwall, 60*l.*; Cardiston, S. Michael, near Shrewsbury, 25*l.*; Kirtlington, S. Mary, Oxon, 20*l.*; Oxenton, S. John the Baptist, near Cheltenham, 15*l.*; Borstal, S. Matthew, near Rochester, 50*l.*; Maney, S. Peter, near Sutton Coldfield, 125*l.*; Churchdown, S. Andrew, near Cheltenham, 100*l.*; and Alwalton, S. Andrew, near Peterborough, 15*l.*, making in all 25*l.* In addition to this the sum of 180*l.* was paid towards the repairs of twelve churches from trust funds held by the Society.

EDINBURGH PLUMBERS.—The fourth annual supper of the Edinburgh and Leith Plumbing Trade was held at the Royal British Hotel, Edinburgh, on the 15th inst. Mr. Daniel MacFie, of Messrs. James Milne & Sons, who presided, in his remarks, reviewed the conditions of trade since the middle of the last century, pointing out how greatly they had improved of recent years. Scientific plumbing and medicine went hand in hand, and the doctor and plumber divided the honours in the decreasing of mortality. In proposing "The Plumbing Trade," Mr. R. K. Hill said the year just closing had been the worst they had ever had, but he was hopeful that there would be an improvement next year. He deplored the introduction of municipal trading, and said that if the system adopted by the Gas Commissioners were followed by the Electrical Department and the Burgh Engineer's Department their trade would be "done" to a very large extent. He considered that private enterprise was quite able to cope with all the work that was to be done. Mr. Alexander Morrison, in reply, advised the trade to co-operate and fight against municipal trading.

CRYSTAL PALACE ENGINEERING SCHOOL.—The "Wilson Premium" for the best paper read before the Crystal Palace Engineering Society during the present session has been awarded by the Council to W. L. Wilkinson for his paper on "Building and Road Construction in India." Other papers read during the session were:—"Motor Car Construction," by J. R. Barnes; "The Construction of Tube Railways," by A. W. Agnew; and "The Electra-Thermal Treatment of Metals," by D. Gollan. The premium was presented to Mr. Wilkinson by Sir William Mather on the occasion of the ninety-ninth distribution of certificates at the above school on Thursday, December 21, at which he presided.

HOUSES OF CELEBRITIES IN LONDON.—A memorial tablet, executed in encaustic ware, has just been affixed upon the front of No. 6, Frith-street, Soho, whither Hazlitt removed in 1829 from Bouverie-street, Fleet-street. He died in that house on September 18, 1830, in the presence of his son and Charles Lamb, and was buried in the churchyard of St. Anne's, Soho. A similar tablet now distinguishes the house, No. 71, Berners-street, Oxford-street, where Coleridge lived during some eighteen months in 1812-3. We gather that a recent project to set a tablet on No. 3, The Grove, Highgate, was relinquished because the demolition of the house was contemplated. Coleridge went, in 1816, to live with James Gillman at Moreton House, Highgate, and removed shortly afterwards with him to No. 3, The Grove. The two houses are illustrated in Mr. A. W. Gillman's volume, "The Gillmans of Highgate."

WAR MEMORIAL, WOOLWICH.—A memorial has been erected at the junction of Frances-street and Artillery-place in honour of the officers of the Army Ordnance Department and the warrant-officers, non-commissioned officers, and men of the Army Ordnance Corps who fell in the South African campaign. The monument, designed from the original drawing by Mr. C. M. Jordan, consists of a base, after the Ionic order and wrought in Aberdeen granite, having on the four sides two drinking-fountains and two inscribed panels. A bronze figure of a man of the Army Ordnance Corps in active service dress stands on the pedestal; the figure was modelled by Mr. F. Coomans and cast by Messrs. J. W. Singer & Sons.

LONDON AND BRIGHTON MOTOR WAY.—A body of promoters have framed a Bill under this title for constructing a fenced motor way in the counties of Surrey and Sussex to be used by vehicles propelled by mechanical or chemical power, to the exclusion of those drawn by animals and of foot-passengers. The proposed road will begin at the junction of Galpins and London road, Croydon, and, passing through Beddington, Chipstead, Merstham, Horley, Balcombe, Cuckfield, Clayton, and Patcham for a length of rather more than forty miles, will terminate on the western side of the London and Brighton road near the Sussex County Police Station, Brighton. The company intend to erect an electricity generating station on the banks of the River Wandle near its source by Waddon Mills, Croydon, and to take twenty-nine perches of common lands at Tyler's Green, Cuckfield. There will be no tunnels, but many bridges, along the new route, and no gradient rate will exceed the maximum of one in thirty. The plans will be prepared by Mr. Richard Hassard, C.E., with Sir Douglas Fox as consulting engineer.

THREE MANCHESTER CHURCHES THREATENED.—In terms of a measure which will be introduced in the course of next session of Parliament a body of trustees will be incorporated for the purposes of demolishing the churches of St. Peter, SS. Simon and Jude, and St. Martin, Manchester, and of applying the proceeds of the sale of the sites and materials to certain ecclesiastical objects in or near the city of Manchester. The church of St. Martin, in German-street, Oldham-road, was built in 1872-3, after the Early English style, and consists of chancel, nave, and

aisle, with a bell-cote over the porch; the church of SS. Simon and Jude, in Granby-row, was built in 1841-2 by the Manchester and Eccles Church Building Society, and contains 800 sittings. In St. Peter's-square, at the end of Mosley-street stands the church of St. Peter, erected in 1788-94 after designs by James Wyatt. The tower, to the south, was added in 1824 by F. Goodwin, and forty-five years ago E. Salomons carried out the interior decoration. The church, which is cruciform on plan, was designed after the simple Doric style and has room for 1,000 sittings. The altar-piece is by A. Carracci, or his school; the work by Salomons included the organ-case, altar recess, and eight paintings in monochrome, being studies from various masters. (See *The Builder* of September 8, 1860.)

COMPENSATION AWARD.—The terms of the award made by the late Mr. James Green as arbitrator in the matter of the compulsory sale of about 2,000 sq. ft. of land near the northern approach to Tower Bridge have just been published. The Great Eastern Railway Company preferred a claim of 16,598*l.* in all, as against the London County Council in compensation for the compulsory surrender of the land which forms portion of their property in Chamber, Royal Mint, and adjoining streets. The railway company's claim was computed by Mr. W. H. Elwell; a counter valuation was supported by evidence given by Mr. A. Rose Stenning and the late Mr. H. H. Collins. The award stands thus:—(1) land taken, 962*l.*; (2) damage to the security of the rent arising from the circumstance that part of the property affected is leased to the Great Northern Railway Company for 999 years, 501*l.*; and (3) consequential damage to the warehouses by reason of the alteration of the character of Little Prescot-street—stated, by request of Sir Edward Clarke, in the form of a special case for the opinion of the High Court—5,859*l.* Sir Edward Boyle, K.C., and Mr. Eldon Bankes, K.C., appeared for the claimants, and Sir Edward Clarke, K.C., and Mr. Edward Morten for the London County Council.

CHURCH OF ST. PETER, GREAT WINDMILL-STREET, SOHO.—Some months ago the Bishop of London appointed a commission to consider the expediency of pulling down this church, having regard to the diminished numbers of the resident population. The project was warmly opposed by many of the parishioners, whose protests, we gather, have resulted in the relinquishment of the scheme. The church was built in 1860-1 after designs, in the Decorated style, by R. Brandon. It stands on the east side of Great Windmill-street, on a site adjoining that of the (old) Argyll dancing-rooms, formerly the tennis-court of Piccadilly Hall. The dancing-rooms have since been absorbed in the Trocadero Restaurant.

THE VACANT SITE, ALDWYCH.—Three offers have been made to take a building lease of the site in Aldwych. One syndicate offers to take a 99 years' term at 50,000*l.* per annum for the erection of the "Irving Repertoire Theatre," with a statue in front of it of the late Sir Henry Irving; another project relates to the building of a covered theatre with shops and a restaurant after the plans, lately modified, of Mr. Gilbee Scott; and the third, being of a similar character, is promoted by a French syndicate for whom Mr. Detmar Blow will act as joint architect. The promoters of the second undertaking—known as "Paris in London"—offer a rental of 55,000*l.*

WAR MEMORIAL, DURHAM.—A cross has been erected in front of Durham Cathedral to the memory of the officers and men of the Durham Light Infantry who fell in the South African War. The monument, which stands 40 ft. high, was designed by Mr. Hodges, of Hexham, the sculptor being Mr. Milburn, of York.

BRITISH FIRE PREVENTION COMMITTEE.—At a meeting of the British Fire Prevention Committee on December 20, Mr. W. Noble Twelvetrees, M.I.Mech.E., A.M.I.E.E., was elected a member of the executive committee, in place of Mr. Lionel J. Langridge, and was at the same time nominated to serve on the General Testing Arrangements (Standing) Sub-Committee.

INTERNATIONAL SOCIETY OF SCULPTORS, PAINTERS, AND GRAVERS.—At the annual general meeting of the International Society of Sculptors, Painters, and Gravers, the Hon. Secretary, Mr. Stirling Lee, read a Report of the transactions of the society during the past year. The Report stated that the society is now incorporated, and both financially and artistically in a sounder position than it has ever been. It has had two exhibitions in London (including the Whistler Memorial Exhibition during the past year) and three in the provinces—in Manchester, Burnley, and Bradford. The sixth Annual Exhibition in London will open to the public on Monday, January 8, 1906, at the New Gallery, Regent-street. The evening reception of the society will be held at the New Gallery on Saturday, January 6, while on Wednesday, January 10, an opening *déjeuner* will take place at the Savoy Hotel.

REREDOS, ST. MARK'S, NEWPORT.—At St. Mark's Church, Newport, recently, the Bishop of Llandaff dedicated the new reredos which has just been erected in the church. The whole of the sanctuary floor has been taken away and a new one laid, making it one step higher. This is composed entirely of marble. The floor is in large squares of Sienna and Connemara green, divided by bands of Devon and Cornish serpentine. The steps are of Irish red. The reredos has been taken away and replaced by a new one of oak. It consists of a canopied and traceried retable with carved panels of the emblems of the Passion, and a centre figure of the emblem of St. Mark. The centre has a projecting canopy, with carved pinnacles surmounted with birds. The cornice, extending the whole length of the retable, and beyond the end of the communion table, is finished at each end by a turret buttress with carved bands surmounted with open tracery and pinnacle-work, the finial being a carved pelican. The east wall is panelled to a height of 7 ft., and a credence table worked into it. This panelling is returned on the north and south sides as far as the communion rail, and into the latter side is worked a canopied and carved sedilia of three seats. A new communion rail is also made. The whole has been entrusted to and carried out by Mr. William Clark, sculptor, Llandaff.

ROOD SCREEN, KILKHAMPTON.—At Kilkhampton Church on Christmas Day the ceremony of unveiling and dedicating a rood screen, as a memorial to the late Mrs. Trynne, took place. The screen is from the design of Mr. G. Fellowes-Prynne. The three figures are after those in Poundstock Church, and are carved in white wood. The cross and base are carved in oak. Mr. Prynne has also designed the carved panels which will be fixed underneath the figures, and these, together with the carved oak chancel door, are already in hand at Messrs. Hems & Sons' studio, Exeter, who are carrying out the work.

TRADES TRAINING SCHOOL.—At Carpenters' Hall, London-wall, on Tuesday, last week, the Lord Chief Justice distributed the prizes, certificates, and medals gained during the year at the Trades Training School, Great Titchfield-street, at the examinations of the Carpenters' Company in sanitary building construction and in carpentry, and in the architectural and building construction evening classes at King's College. Captain G. R. B. Drummond (Master of the Carpenters' Company) presided, and was supported by members of the companies which conduct the school. Mr. John Wilson (Chairman of the committee) stated that the number of students was increasing, and that there were now 265 members on the books. The rule that no students should be admitted unless they were engaged during the day as mechanics in the trade in which they sought instruction was very rigidly enforced. The Lord Chief Justice, in an address to the students, said it was extremely interesting to see that there were candidates who desired to improve themselves by passing examinations in what he might call the technical knowledge of sanitary building construction, one of the most important developments of sanitary and hygienic science of the present day, for there could be no doubt that some of our most beautiful architectural efforts of the last 300 years, viewed from the standpoint of modern sanitary construction, were lamentably defective. There was perhaps a better aspect of the question which went beyond individual advancement, individual skill, or individual success by those who were willing to make progress by working in their leisure hours. There was the removal of the reproach too freely cast about by people who did not understand the question that the British workman could not do as good work as his foreign competitor. He denied that altogether. He asserted that the skilled and instructed British workman was as good in his own line as any workman in any other part of the world, and the reproach, if anything, was not a reproach which could be brought against the workmen themselves, but against those who, forty or fifty years ago, did not give the operative opportunities enough of improving himself and thereby raising himself to the higher branches of his trade.

EDINBURGH, ETC., BUILDING TRADES.—The annual dinner in connexion with the Edinburgh, Leith, and District Employers' and Allied Trades' Association, and the Building Trades' Exchange of the City and District of Edinburgh, was held in the Royal British Hotel, Princes-street, Edinburgh, on the 21st inst., Mr. Patrick Knox presiding over a company numbering over a hundred. The croupiers were Messrs. W. Thomson, James Moscrip, and James Millar. After the loyal and patriotic toasts had been honoured, "The Corporations of Edinburgh and Leith," was proposed by Parish Councillor Slater, who expressed the hope that the Corporations would co-operate more in the future than they had done in the past. In replying for Edinburgh, Councillor A. A. Murray said the building trade was one of the most important in the city, and one that the Corporation ought to recognise to the full, for among Edinburgh buildings were to be found some of the best examples of architecture. Referring to the recently appointed Tramways Committee of Edinburgh Town Council, he said it was nonsense to say that there was no work for them to do. He hoped to see Edinburgh and Leith co-operating in the future in such schemes as the tramways, etc. Councillor Craig, Leith, said he did not think corporations should put their hands into the mortar tub and build houses in opposition to the ratepayers. He was certain that builders were perfectly able and willing to build houses that would satisfy all classes of people. Messrs. David Metie and W. Graham-Yooll replied for the building trades, proposed by Mr. David Dick (Glasgow). Mr. Metie said they had passed through a very dull season, but he believed they had come through the worst, and were entering upon a new cycle of prosperity. Mr. Graham Yooll regretted that full use was not being taken of the Building Trades Exchange. It would be infinitely to the advantage of those in the trades if they had a regular market at a stated hour where they could meet merchants. "The Architects and Surveyors" was proposed by Councillor Neill M'Leod, and replied to by Mr. Harold O. Tarbolton, F.R.I.B.A., and Mr. Robert Jerdan. "Kindred Associations" was proposed by Mr. James Millar. Messrs. Robert Russell and John M'Ewan (Glasgow) replied.

CAPITAL AND LABOUR.

GLASGOW GLAZIERS.—The majority of the Glasgow operative glaziers, to the number of about 100, have struck work consequent upon a three months' notice issued by the masters, who intimated a reduction in wages from 8½d. to 8d. —the week being of 51 hours. A conference was held, at which the employers stated that, owing to the state of the building trade, they would require to fall into line with the masons, joiners, and plumbers' employers. They desired, further, that the by-laws might be altered so as to make the wages fixed for a year, as in the case of the joiners, instead of for three months, as at present. They considered their reasons fair and valid, but the proposals were rejected by the men.—*Scotsman.*

Legal.

ACTION FOR BREACH OF COVENANT.

MR. JUSTICE BRAY, in the King's Bench Division on the 21st inst., delivered a considered judgment in the case of Williams *v.* Gabriel and others, an action by the plaintiff against the defendants to recover damages for breach of a covenant for quiet enjoyment. The facts of the case sufficiently appear from the following judgment.

His lordship said that in this case the plaintiff sued the defendants as the representatives of Arnold Gabriel deceased, for damages for breach of a covenant for quiet enjoyment. The statement of claim contained an alternative claim for trespass, nuisance, and negligence, but at the trial counsel for the plaintiff rested his case, as he was bound to do, on breach of covenant. The facts were these:—On October 19, 1886, the said Arnold Gabriel demised to the plaintiff a shop and kitchen on the ground floor of a building known as Aberdeen-buildings, in Emmott-street, Limehouse, and four rooms on the first floor above the shop and kitchen and portion of a yard adjoining the premises to be occupied for the purpose of a coffee-house. The lease was for 21 years, determinable by the lessee at the end of the seventh or fourteenth year, and the rent was 40*l.* The only material covenant by the lessor was the covenant for quiet enjoyment which provided that Arnold Gabriel for himself, his heirs, executors, administrators, and assigns covenanted with the plaintiff that the plaintiff paying the rent thereinbefore reserved and performing and observing the covenants on his part thereinbefore contained should and might peaceably enjoy the demised premises during the said term without any interruption or disturbance by Arnold Gabriel or any person claiming under him. Aberdeen-mansions were a block of flats recently built and intended to be let out in flats or tenements, and there were several floors above the premises demised to the plaintiff. About the year 1891 Gabriel assigned his reversion in whole of the buildings to Jackson. There was no evidence that at this time the buildings were out of repair. Some considerable time before 1904 the buildings other than those occupied by the plaintiff got very much out of repair, all the tenants other than the plaintiff left, and the plaintiff's rooms became injured by wet. In 1904 Aberdeen-buildings got so dilapidated that proceedings were taken by the London County Council against the owners under the London Building Acts, which resulted in an order of March 25, 1904. At this time the reversion was vested in Messrs. Attenborough as mortgagees, a Mr. Hargreave being the mortgagor. On July 4 these gentlemen began to pull down the buildings, and after a time completely exposed part of the plaintiff's premises, and the plaintiff was forced by these operations to leave in May, 1905. The plaintiff alleged that there was an

interruption of his quiet enjoyment, for which the representatives of the original lessor were liable. There was no doubt that the plaintiff had suffered considerable damages, but the defendants denied liability *in toto*. His lordship then dealt at some length with the decided cases bearing on the point, and said he must hold that there had been an interruption of the plaintiff's quiet enjoyment, but, on the facts, he was of opinion that Messrs. Attenborough could not claim under the lessor, Arnold Gabriel, the right to do the acts complained of, and therefore that his representatives were not liable for what Messrs. Attenborough did. He accordingly entered judgment for the defendants with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

26,359 of 1904.—J. E. RUSSELL: *Cooking Ranges.*

This relates to a cooking range, and consists in the mode of mounting and operating a damper to control the heat from the fire, comprising a rod engaging with an inclined lug and drawn forward or pushed back.

26,511 of 1904.—A. BLACK and D. BLACK: *Windows.*

This relates to a window having sliding and hinged sashes, and consists in the lower sash being connected on to an endless chain running on pulleys and the upper sash being likewise connected to an endless chain running on pulleys, each chain being operated by means of wheel and worm gear.

2,194 of 1905.—J. WENHAM: *Inspection Boxes for Electric Light Leads and the like.*

This relates to inspection boxes for electric wires and cables and the like, and consists in the employment of pockets or recesses, and wooden or other suitable plugs to which the cover or frame may be secured by ordinary wood screws or nails.

2,766 of 1905.—C. G. MAJOR, E. C. STEVENS, and P. H. STEVENS: *Locks and Switches for Gates of Electrically-Controlled Lifts.*

This relates to a lift wherein a starting mechanism is electrically controlled, and consists in the combination of a hand catch on the door, a hand switch, and an interlocking trigger automatically actuated by the lift cage.

3,558 of 1905.—C. P. SHOWELL: *Window Casement Opening Mechanism.*

This relates to window casement opening mechanism, having upon the movable casement a bracket provided with a pivoted joint, to which is attached the one end of an arm or link, the other end of said link being pivotally attached to a screw nut, which is made to work upon a screw. The one end of this screw is pivotally carried in a plain angle bracket, which is secured to the fixed part of the frame, the other end of the said screw being made square in section, so as to enter a square hole in a small bevel tooth wheel, which is carried in a suitable bearing upon an angle bracket, the outer end of the wheel-bearing boss being preferably riveted over to prevent its removal, but yet leaving it free to rotate. Gearing into this bevel wheel is another smaller wheel, which is free to rotate upon a fixed stud carried upon the said bracket and at the back of the said wheel, and in one therewith is formed a cord-grooved pulley, upon which the operating cord is carried, suitable openings being made in the bracket for the cord to pass through.

5,294 of 1905.—J. H. HINDLE: *Safety Appliances for Cage Lifts.*

This relates to safety appliances for cage lifts, and consists in the passing of the suspending ropes of lift cages partially around "V"-grooved pulleys, so that the friction between the rope and the pulley due to the weight of the cage alone prevents the pulley from rotating, a spring being applied to rotate the said pulley, in case the friction disappears, either from the rope stretching or breaking, the rotation of the pulley operating the safety catches or grips which arrest the downward motion of the cage.

5,530 of 1905.—O. LEINBROCK: *Adjustable Metallic Network as Cover Protector for Earthenware Against Cracking.*

This relates to an adjustable metallic network as cover protector for earthenware against cracking, the network being made of wire or short pieces of metallic flat ribands, fastened together by links or joints of suitable form, and tightened or loosened by lock pieces connected therewith. The locks are adapted to be shortened in themselves, and are connected to the netting with one end and to a support piece with the other end, and tighten the netting in the vertical direction.

6,417 of 1905.—J. LEVER: *Roof Ventilator or Chimney Top.*

This relates to a ventilator or chimney top formed with two series of exterior or air up-take passages surrounding the main up-take, one series leading into an enlarged cavity situated above the said central up-take and the other series leading into a hood or cover, having its lower part overhanging and enclosing the upper part of the walls of the enlarged cavity.

6,894 of 1905.—J. DUGDALE: *Fastener for Windows and the like.*

This relates to a fastener for windows and the like, composed of two or more pieces of metal, wood, or other suitable material pivoted to any convenient portion of the upper sash of a window frame, and arranged to be locked or latched in a box or spring fastening secured to the top of the lower sash.

7,228 of 1905.—E. A. RAWLENCE: *Privies or Latrines, Earth-Closets, and Water-Closets.*

This relates to privies or latrines, and consists in the combination with an auxiliary platform hinged to the inclined front of the body of the privy or latrine, of an auxiliary adjustable cover having a scooped back and being arranged to slide on the main cover.

8,402 of 1905.—L. SCHLENTHEIM & DIESPEKER, LTD.: *Method of Constructing Mosaic Walls or of Covering Surfaces with Mosaic.*

This relates to a method of constructing mosaic walls, and consists in the wall first being covered with a thin layer of cement mastic and, before this is dry, a mosaic, consisting, say, of marble chips, and cement is floated thereon by means of a trowel or the like. Then the surface is smoothed down slightly with a trowel, and when the mosaic is slightly set it is compressed by a device which, while capable of travelling over the surfaces, applies the pressure always in a direction normal, or practically normal, to the surface of the wall, so as to bring the whole to a true surface and squeeze out any superfluous cement, which can afterwards be removed by wiping or scraping. The work is then allowed to stand for two or three days, when it is scraped with a flat steel scraper, after which it is rubbed with sandstone, or other abrading material, and water until a flat and sufficiently fine surface has been obtained.

9,373 of 1905.—R. DUNCAN: *Coin-freed Locks for Lavatories.*

This relates to coin-freed locks for lavatories, and has for its object to provide means whereby locks can be actuated not only by the introduction of a penny piece, but also by its equivalent in half-pennies, and is applicable to that class of locks by which upon the insertion of a penny the coin forms the medium by which the sliding knob of the lock engages with the latch, and thereby allows of the latter being withdrawn, while upon the latch being drawn back a second time by means of an inner independent revolving knob the penny is released, and falling into the coin box provided at the lower part of the lock.

13,264 of 1905.—A. CIOLFI: *Water-closets.*

This relates to a water-closet, and consists in the combination of a casing, a rotary bowl within said casing, means for rotating said bowl to empty the contents of the same, means rendered operative by the operation of the bowl, and rotating means for electrically sterilising the contents of the said bowl.

19,245 of 1905.—J. BROADFOOT & SONS, LTD., and J. R. APPLEBY: *Weather-tight Sliding Windows.*

This relates to a weather-tight sliding window, and consists of a counterbalanced window frame carried between guides on a fixed frame and secured by wedges acting between parts on the fixed frame, and the faces of the sides of the window frame, and operatively connected to a transverse shaft adapted to be rotated to operate the wedges by a handled lever or by gearing.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

TO CORRESPONDENTS.

NOTE.—The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

Letters or communications (beyond mere news items) which have been duplicated for other journals are NOT DESIRED.

All communications must be authenticated by the name and address of the sender whether for publication or not. No notice can be taken of anonymous communications.

We are compelled to decline pointing out books and giving addresses.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance. The Editor cannot undertake to read and consider articles offered for acceptance unless they are type-written.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; those relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and *not* to the Editor.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 13.—By SEDGWICK, SON, & WEALL (at King's Langley).

King's Langley, Herts.—Vicarage-la., two freehold cottages, w.r. 22*l.* 2s.	£355

December 18.—By WHITE & SONS.

Smithfield.—Long-la., "The White Hart" p.h., and house and shop adjoining, and freehold rental of 160*l.*, reversion in 40 yrs.	3,900

December 19.—By CROFTS & CO.

Tooting.—73, 75, and 77, Longley-rd., u.t. 72½ yrs., g.r. 15*l.*, y.r. 90*l.*	610

By FLEURET, SONS, & ADAMS.

Sydenham.—88, 90, and 92, Wells-rd. (s.), u.t. 19¾ yrs., g.r. nil, y.r. 100*l.*	740

By MADDISON, MILES, & MADDISON (at Yarmouth).

Yarmouth, Norfolk.—24, Rodney-rd., f., y.r. 15*l.* 10s.	340
20, Hammond-rd., f., w.r. 15*l.* 12s.	220

December 20.—By HARRODS'.

Wood Green.—1, Mount View-villas, u.t. 94 yrs., g.r. 6*l.* 10s., y.r. 35*l.*	340

By E. & S. SMITH.

Clerkenwell.—30 to 39, St. Helena-pl., u.t. 6 yrs., g.r. 11*l.* 10s., w.r. 318*l.*	455
Pentonville.—45, Collier-st., with builder's yard and workshop, area 2,200 ft., f., e.r. 50*l.*	540

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

MEETINGS.

MONDAY, JANUARY 1.

London Institution.—Professor Vivian B. Lewes on "Our Atmosphere and its Wonders," illustrated by experiments. 4 p.m.

WEDNESDAY, JANUARY 3.

London Institution.—Professor Vivian B. Lewes on "Our Atmosphere and its Wonders," illustrated by experiments. 4 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary Meeting of the Members. 8 p.m.

Architectural Association Discussion Section.—Mr. P. I. Turner on "The Houses of Parliament." 7.30 p.m.

FRIDAY, JANUARY 5.

London Institution.—Professor Vivian B. Lewes on "Our Atmosphere and its Wonders," illustrated by experiments. 4 p.m.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.			
Hard Stocks	1	7	0	per 1000 alongside, in river.		
Rough Stocks and Grizzles	1	4	0	,,	,,	,,
Facing Stocks	2	0	0	,,	,,	,,
Shippers	2	0	0	,,	,,	,,
Flettons	1	5	6	,,	at railway depôt.	
Red Wire Cuts	1	11	0	,,	,,	,,
Best Fareham Red	3	12	0	,,	,,	,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,,	,,
Best Blue Pressed Staffordshire	4	1	0	,,	,,	,,
Do. Bullnose	4	6	6	,,	,,	,,
Best Stourbridge Fire Bricks	3	15	6	,,	,,	,,
GLAZED BRICKS.						
Best White and Ivory Glazed Stretchers	12	0	0	,,	,,	,,
Headers	11	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	16	0	0	,,	,,	,,
Double Stretchers	19	0	0	,,	,,	,,
Double Headers	16	0	0	,,	,,	,,
One Side and two Ends	19	0	0	,,	,,	,,
Two Sides and one End	20	0	0	,,	,,	,,
Splays, Chamferred, Squints	20	0	0	,,	,,	,,
Best Dipped Salt Glazed Stretchers, and Header	12	0	0	,,	,,	,,
Quoins, Bullnose, and Flats	14	0	0	,,	,,	,,
Double Stretchers	15	0	0	,,	,,	,,
Double Headers	14	0	0	,,	,,	,,
One Side and two Ends	15	0	0	,,	,,	,,
Two Sides and one End	15	0	0	,,	,,	,,
Splays, Chamferred, Squints	14	0	0	,,	,,	,,
Second Quality White and Dipped Salt Glazed	2	0	0	,,	less than best.	

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered.
Thames Ballast	5	3	,, ,,
Best Portland Cement	26	0	per ton, ,,
Best Ground Blue Lias Lime	19	0	,, ,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime	11s. 0d. per yard, delivered.
Stourbridge Fireclay in sacks	27s. 0d. per ton at rly. dpt.

PRICES CURRENT.—Continued on page 713.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENT.

(For some Contracts, etc., still open, but not included in this List, see previous issues.)

COMPETITION.

Nature of Work.	By whom Required.	Premiums.	Designs to be delivered
*PROPOSED PUBLIC BUILDING LLANIDLOES	Mr. David Davies	Not stated	Jan. 13

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, etc., supplied by	Tenders to be delivered
Wombwell.—Road Materials	Wombwell U.D.C.	J. W. Harrison, Surveyor, Town Hall, Wombwell	Jan. 2
Dartford.—Granite	Dartford U.D.C.	W. Kay, Clerk, Council Offices, Dartford	do.
*ARTIFICIAL FLAG PAVING	Willesden District Council	Council's Engineer, Dyne-road, Kilburn, N.W.	do.
*ROAD-MAKING AND PAVING WORKS	do.	do.	do.
Mablethorpe.—Children's Wing to Convalescent Home	The Committee	R. H. Fowler, Architect, Louth	do.
Crumpsall.—400 yds. of Opal Tiling at Workhouse	Manchester Guardians	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	Jan. 3
London.—112 Spans of 10 ft.	Bengal and N.W. Ry. Co.	A. Izat, 237, Gresham House, Old Broad-street, E.C.	do.
Bourton.—Water Supply Works	Faringdon U.D.C.	A. P. I. Cotterell, Engineer, 28, Baldwin-street, Bristol	do.
Glasgow.—Repairing Embankment of Clyde	Glasgow Corporation	Office of Public Works, City-chambers, Glasgow	Jan. 4
Bognor.—Private Street Works, Circus-street, etc.	Bognor U.D.C.	Surveyor, Council Offices, Bognor	do.
Elgin.—Dwelling-house, Culbard-street		C. C. Doig, Architect, Elgin	do.
Salford.—Retorts, Firebricks, etc.	Salford Gas Committee	W. W. Woodward, Engineer, Gas Offices, Bloom-street, Salford	do.
Leeds.—Paving and Flagging Streets	Leeds Corporation	City Engineer's Office, Municipal Buildings, Leeds	do.
Saltburn-by-the-sea.—Private Street Works	Saltburn U.D.C.	G. S. L. Bains, C.E., Surveyor, Council Offis., Windsor-st., Saltburn	do.
Manchester.—48 tons of Cast-iron Pipes	Manchester Waterworks Committee	Secretary, Waterworks Offices, Town Hall, Manchester	Jan. 6
Leith.—Additions, etc., to North Fort-street School	Leith School Board	G. Craig, Architect, 85, Duke-street, Leith	do.
Saddleworth.—Road Materials	The U.D.C.	E. Rowbotham, Clerk, Council Offices, Uppermill, near Oldham	do.
*PAVING, DRAINAGE: REPAIRS TO ROOFS, ETC.	St. Marylebone Guardians	A. Saxon Snell, Architect, 22, Southampton-buildings, W.C.	Jan. 8
Bristol.—Open Timber Sheds, Portishead Docks	Bristol Docks Committee	W. W. Squire, Engineer, Cumberland-road, Bristol	do.
Bristol.—2 Cornish Boilers at Eastville Workhouse	Bristol Guardians	J. J. Simpson, Clerk, St. Peter's Hospital, Bristol	do.
Lemington-on-Tyne.—Crgted. Iron Cotge. at Cemtry.	Newburn U.D.C.	T. Gregory, Surveyor, Council Offices, Newburn	do.
Newton Abbot.—Laying-out Cattle Market	Newton Abbot U.D.C.	L. Stevens, Surveyor, Town Hall, Courtenay-street, Newton Abbot	do.
Pontypridd.—General Stores	Pontypridd U.D.C.	P. R. A. Willoughby, Engineer, Council Offices, Pontypridd	do.
Manchester.—Fitt.-up 62 Wash-bths., Lavatories, etc.	Manchester Corporation	City Architect, Town Hall, Manchester	do.
Bolsover.—Reconstruction of Sewage Disposal Works	Bolsover U.D.C.	O. C. Furness, Engineer, Town End, Bolsover	do.
Manchester.—Strengthening Hoyle-street Bridge	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Manchester.—Strengthening Charlton-street Bridge	do.	do.	do.
Teignmouth.—Making-up Upper Ferndale-road	Teignmouth U.D.C.	C. F. Gettings, Surveyor, Town Hall, Teignmouth	Jan. 9
Perry Barr.—Rowley Rag and Blast Furnace Cinder	Perry Barr U.D.C.	E. Bailey, Surveyor, Council House, Green-la., Hamstead, B'ham.	do.
Ashton-in-Makerfield.—Street Works	Ashton U.D.C.	T. Burgess, Surveyor, Council Offices, Ashton-in-Makerfield	do.
Edmonton.—Private Street Works	Edmonton U.D.C.	G. Eades Eachus, Engineer, Town Hall, Lower Edmonton	do.
*REPAIRS TO PONTOON, ETC., FULHAM	Metropolitan Asylum Board	Office of the Board, Embankment, E.C.	Jan. 10
*NEW FILTER TO RESERVOIR, TOTTENHAM	do.	do.	do.
Manchester.—Reconstruction of Poland-street Bridge	Manchester Corporation	City Surveyor's Office, Town Hall, Manchester	do.
Manchester.—Reconstruction of Jersey-street Bridge	do.	do.	do.
*LAYING SEWERS AND FORMING ROADS		W. Newton Dunn, 1 and 2, Bucklersbury, E.C.	Jan. 11
Southampton.—Thin Zinc Plates	Director General, Ordnance Survey	Officer in Charge of Stores, Ordnance Survey Office, Southampton	Jan. 12
Brighton.—Granite Kerb and Channel	Brighton Corporation	Borough Surveyor, Town Hall, Brighton	do.
Monmouth.—Hereford-road Sewer, etc.	Monmouth Corporation	G. F. Grimwood, Engineer, Monmouth	Jan. 13
Manchester.—Materials	Manchester Rivers Committee	Secretary of Rivers Department, Town Hall, Manchester	do.
Leeds.—Heating to Infirmary Wards at Workhouse	Leeds Guardians	T. Winn & Sons, Architects, Albion-street, Leeds	do.
Leeds.—Wdboard. Wall of Workhse. Est., Beckett-st.	do.	do.	do.
Caversham.—Provided School and Caretaker's House	Oxfordshire Education Committee	W. H. Ashford, A.R.I.B.A., 90, New-street, Birmingham	do.
*NEW SCHOOLS, HIGHWAY ESTATE	Berkshire Education Committee	Edmund Fisher, Architect, 10, York-building, Adelphi, W.C.	do.
*WEIGH OFFICE, MESS-ROOM, ETC., FOLESHILL	Coventry Gas Committee	F. W. Stevenson, Engineer, Gasworks, Coventry	Jan. 15
Reading.—Stores	Berkshire County Council	County Surveyor's Office, Bank-chambers, Cross-street, Reading	do.
Durban, Natal.—30-in. Steel Pipes	Durban Corporation	W. H. Radford, C.E., Albion-chambers, Nottingham	do.
Motherwell.—Sewers	District Comm. Wd., Co. of Lanark	W. L. Douglas, C.E., District Offices, Hamilton	do.
Newcastle-under-Lyme.—Engineering, King's Baths	Baths Committee	J. B. Langley, Architect and Surveyor, 49, Deansgate, Manchester	do.
Newcastle-under-Lyme.—Wall Tiling at King's Baths	do.	do.	do.
Leeds.—Building in Albion-street and Albion-place	Leeds Y.M.C.A. Committee	W. H. Thorp, Architect, 61, Albion-street, Leeds	do.
*ROADMAK., ETC., WORKS, MANOR COURT-RD.	Hanwell U.D.C.	Council's Surveyor, Church-road West, Hanwell	do.
Peasedown St. John.—Water Supply	Bath and Clutton R.D.Cs.	W. F. Bird, C.E., Midsomer Norton	Jan. 16
Leeds.—Police Station and Mortuary	Leeds Corporation	H. Ascough Chapman, Architect, Prudential-bldgs. Park-row, Leeds	do.
Crookhill.—Council School	Durham Education Authority	W. H. Bendle, Architect, 33, Grainger-st. West, Newcastle-on-Tyne	do.
Leeholme.—Council School	do.	Clark & Moscrop, Architects, Feethams, Darlington	do.
*MAKG.-UP CARRIAGEWAY, LANGTHORNE-ST.	Fulham Borough Council	Borough Surveyor, Town Hall, Fulham, S.W.	Jan. 17
London.—Spans for Jumna Bridge	East Indian Ry. Co.	C. W. Young, Sec., Nicholas-lane, London, E.C.	do.
*WORKS, MATERIALS, AND SERVICES	Hampstead Borough Council	Borough Engineer, Town Hall, Haverstock-hill, N.W.	do.
*OFFICES AT WORKHOUSE	Hendon Guardians	Union Offices, Edgware	do.
Swansea.—Extending West Pier Seawards	Harbour Trustees	A. O. Schenk, Engineer, Harbour Offices, Swansea	Jan. 18
Shieldhall.—Precipitation Tanks	Glasgow Corporation	City Chambers, 64, Cochrane-street, Glasgow	Jan. 19
Swindon.—Ferndale-road Council School	Swindon Corporation	Nicholls & Stockwell, Architects, 25, Regent-circus, Swindon	do.
Malpas.—3 Blocks of Cottages	Malpas R.D.C.	T. M. Lockwood & Sons, Architects, Foregate-street, Chester	Jan. 20
Wigan.—Underground Conveniences	Wigan Corporation	Borough Engineer's Offices, Wigan	do.
Wimbledon.—Air Compressors, Durnsford-road	Wimbledon Corporation	C. H. Cooper, Borough Engineer, Town Hall, Wimbledon	Jan. 22
Folkestone.—Shelter, with Conveniences, Marine-gdns.	Folkestone Corporation	A. E. Nichols, Borough Engineer, Corporation Offices, Folkestone	do.
Stratford-upon-Avon.—Sewage Disposal Works	Corporation	Willcox & Raikes, Engineers, 63, Temple-row, Birmingham	do.
Enfield.—Contract No. 1 of Railway to Cuffley	Great Northern Railway Co.	Engineer, King's Cross Station, London, N.	Jan. 23
Twickenham.—Sewage Disposal Works, Section F	Twickenham U.D.C.	F. W. Pearce, F.S.I., Town Hall, Twickenham	Jan. 24
Pendlebury.—Sprinklers, Slack Brook Sewage Works	Swinton and Pendlebury U.D.C.	H. Entwisle, Surveyor, Council Offices, Swinton, Manchester	do.
*STORES, MATERIALS, ETC.	Camberwell Borough Council	Borough Engineer, Town Hall, Camberwell, S.E.	Jan. 29
Ipswich.—New School, Ranelagh	Education Committee	J. A. Scheuermann, Architect, 23, High-street, Ipswich	do.
Hillingdon East.—Sewer Works	Uxbridge R.D.C.	J. F. Stow, Engineer, Corn Exchange, Uxbridge	Jan. 30
Thirsk.—Lambert Hospital Extension		T. Stoes, Architect, Westgate, Thirsk	Jan. 31
*ADDITIONS, ETC., AT SCHOOL, PLUMPTON	East Sussex Local Educ. Authority	County Surveyor, County Hall, Lewes	Feb. 2
Plumpton.—Additions, etc., to School	E. Sussex Local Education Authority	F. J. Wood, County Surveyor, County Hall, Lewes	do.
*ISOLATION HOSPITAL	Cheshunt U.D.C.	Clerk to the Council, Manor House, Cheshunt	Feb. 12
Dublin.—Rebuilding Premises	Aiden Grennell & Co.	A. E. Murray, Architect, 37, Dawson-street, Dublin	No date.
Barton.—Sewer	Tarvin R.D.C.	H. G. Bailey, Clerk, Crypt-chambers, Chester	do.
Manchester.—1,000 ft. of Seamless Copper Tubing	Manchester Corporation	General Superintendent, Osborne-street Baths, Manchester	do.
Newcastle-on-Tyne.—Reprs., Ptng., etc., Police Stns.	Northumberland County Council	J. A. Bean, County Surveyor, Moothall, Newcastle-on-Tyne	do.
Oswaldtwistle.—Hall, Offices, etc., Sun-street	Church and Weavers', etc., Assoc.	G. Riley, Architect and Surveyor, 24, Albert-street, Oswaldtwistle	do.
*ADDS., HORNCHURCH PK.-LA., SCHS., ROMFD.	Essex Education Committee	Office of the District Committee, 44, Eastern-road, Romford	do.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
*SURVEYOR AND INSPECTOR OF NUISANCES	Dawlish U.D.C.	150*l.*	Jan. 20

Those marked with an asterisk (*) are advertised in this number. *Competitions*, iv. *Contracts*, iv. vi. viii. x. *Public Appointments*, xviii.

PRICES CURRENT.—*Continued from page 711.*

STONE.

BATH STONE—delivered on road waggons, Paddington Depôt	1	6½ per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½ „ „
PORTLAND STONE (20 ft. average)—Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1 „ „
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½ „ „

	s.	d.	
Ancaster in blocks	1	10	per ft. cube, deld. rly. depôt.
Beer „	1	6	„ „
Greenshill „	1	10	„ „
Darley Dale in blocks	2	4	„ „
Red Corsehill „	2	2	„ „
Closeburn Red Freestone	2	0	„ „
Red Mansfield „	2	4	„ „
YORK STONE—*Robin Hood Quality.*			
Scappled random blocks.	2	10	„ „
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super., „
6 in. rubbed two sides ditto, ditto	2	6	„ „
3 in. sawn two sides slabs (random sizes)	0	11½	„ „
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½	„ „
1½ in. to 2 in. ditto, ditto	0	6	„ „
HARD YORK—			
Scappled random blocks.	3	0	per ft. cube, „
in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super., „
6 in. rubbed two sides ditto	3	0	„ „
3 in. sawn two sides slabs (random sizes)	1	2	„ „
2 in. self-faced random flags	0	5	„ „

Hopton Wood (Hard Bed) in blocks	2	0	per ft. cube, deld. rly. depôt.
„ „ „ 6 in. sawn both sides landings	2	7	per ft. super. deld. rly. depôt.
„ „ „ 3 in. sawn both sides random slabs	1	0	„ „
„ „ „ 2 in. do.	0	8½	„ „

SLATES.

In. In.	£	s.	d.	
20×10 best blue Bangor	13	2	6	per 1000 of 1200 at r. d.
20×12 „ „	13	17	6	„ „
20×10 first quality „	13	0	0	„ „
20×12 „ „	13	15	0	„ „
16×8 „ „	7	5	0	„ „
20×10 best blue Portmadoc	12	12	6	„ „
16×8 „ „	6	12	6	„ „
20×10 best Eureka unfading green	15	17	6	„ „
20×12 „ „	18	7	6	„ „
18×10 „ „	13	5	0	„ „
16×8 „ „	10	5	0	„ „
20×10 permanent green	11	12	6	„ „
18×10 „ „	9	12	6	„ „
16×8 „ „	6	12	6	„ „

TILES.

	s.	d.	
Best plain red roofing tiles	42	0	per 1000 at rly. depôt.
Hip and Valley tiles	3	7	per doz. „
Best Broseley tiles	50	0	per 1000 „
Do. Ornamental tiles	52	6	„ „
Hip and Valley tiles	4	0	per doz. „
Best Ruabon red, brown, or brindled do. (Edwards)	57	6	per 1000 „
Do. Ornamental do.	60	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	0	„ „
Best Red or Mottled Staffordshire do. (Peakes)	51	9	per 1000 „
Do. Ornamental do.	54	6	„ „
Hip tiles	4	1	per doz. „
Valley tiles	3	8	„ „
Best "Rosemary" brand plain tiles	48	0	per 1000 „
Best Ornamental tiles	50	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	8	„ „
Best "Hartshill" brand plain tiles, sand-faced	50	0	per 1000 „
Do. pressed	47	6	„ „
Do. Ornamental do.	50	0	„ „
Hip tiles	4	0	per doz. „
Valley tiles	3	6	„ „

WOOD.

BUILDING WOOD.	At per standard. £	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best.		
Battens: seconds	0	10	0	„	„	
2 in. by 4 in. and 2 in. by 6 in.	9	0	0	10	0	0
2 in. by 4½ in. and 2 in. by 5 in.	8	10	0	9	10	0
Foreign Sawn Boards—						
1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.		
¾ in.	1	0	0	„		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft. 4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.)	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	3	5	0	3	15	

WOOD (*continued*).

JOINERS' WOOD.	At per standard. £	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	25	0	0
3 in. by 9 in.	22	0	0	23	0	0
Battens, 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals, 3 in. by 11 in.	18	10	0	20	0	0
„ „ 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Second yellow deals, 3in. by 11in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg—						
First white deals, 3 in. by 11 in.	14	10	0	15	10	0
„ „ 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
„ „ 3 in. by 9 in.	12	10	0	13	10	0
„ „ battens	10	0	0	11	0	0
Pitch-pine: deals	16	10	0	20	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	„		
Seconds, regular sizes	33	0	0	„		
Yellow Pine oddments	28	0	0	„		
Kauri Pine—Planks, per ft. cube	0	3	6	0	5	0
Danzig and Stettin Oak Logs—						
Large, per ft. cube	0	3	0	0	3	6
Small „ „	0	2	6	0	2	9
Wainscot Oak Logs, per ft. cube	0	5	0	0	5	6
Dry Wainscot Oak, per ft. sup. as inch	0	0	8	0	0	9
¾ in. do. do.	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0	0	9	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	0	1	0
Teak, per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	6
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. „ „	0	14	0	0	18	0
¾ in. by 7 in. white „ „	0	10	0	0	11	6
1 in. by 7 in. „ „ „	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	6	5	0	7	0	0
Compound Girders, ordinary sections	7	15	0	8	15	0
Steel Compound Stanchions	9	7	6	10	17	6
Angles, Tees, and Channels, ordinary sections	7	15	0	8	15	0
Flitch Plates	8	0	0	8	10	0
Cast Iron Columns and Stanchions including ordinary patterns	6	17	6	8	0	0

METALS.

IRON—	Per ton, in London. £	s.	d.	£	s.	d.
Common Bars	8	0	0	8	10	0
Staffordshire Crown Bars, good merchant quality	8	10	0	9	0	0
Staffordshire "Marked Bars"	10	0	0	—		
Mild Steel Bars	8	15	0	9	0	0
Hoop Iron, basis price	9	5	0	9	10	0
„ „ Galvanised	17	0	0	—		
(*And upwards, according to size and gauge.)						
Sheet Iron Black—						
Ordinary sizes to 20 g.	9	10	0	—		
„ „ 24 g.	10	10	0	—		
„ „ 26 g.	12	0	0	—		
Sheet Iron, Galvanised, flat, ordinary quality—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	14	0	0	—		
Ordinary sizes to 22 g. and 24 g.	14	10	0	—		
„ „ 26 g.	15	0	0	—		
Sheet Iron, Galvanised, flat, best quality—						
Ordinary sizes to 20 g.	17	0	0	—		
„ „ 22 g. and 24 g.	17	10	0	—		
„ „ 26 g.	19	0	0	—		
Galvanised Corrugated Sheets—						
Ordinary sizes 6 ft. to 8 ft. 20 g.	13	10	0	—		
„ „ 22 g. and 24 g.	14	0	0	—		
„ „ 26 g.	15	5	0	—		
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11	10	0	—		
Best Soft Steel Sheets, 22 g. & 24 g.	12	10	0	—		
„ „ „ 26 g.	14	15	0	—		
Cut Nails, 3 in. to 6 in.	9	10	0	9	15	0
(Under 3 in., usual trade extras.)						

LEAD, &c.

	Per ton, in London. £	s.	d.	£	s.	d.
LEAD—Sheet, English, 3lb. and up.	20	0	0	—		
Pipe in coils	20	10	0	—		
Soil pipe	23	0	0	—		
Compo pipe	23	0	0	—		

LEAD, &c. (*continued*)—

	Per ton. in London. £	s.	d.	£	s.	d.
ZINC—Sheet—						
Vieille Montagne ton	33	0	0	—		
Silesian	32	15	0	—		
COPPER—						
Strong Sheet per lb.	0	1	0	—		
Thin „ „	0	1	1	—		
Copper nails „	0	0	11	—		
BRASS—						
Strong Sheet „	0	0	11	—		
Thin „	0	1	0	—		
TIN—English Ingots „	0	1	7	—		
SOLDER—Plumbers' „	0	0	8	—		
Tinmen's „	0	0	10	—		
Blowpipe „	0	0	11	—		

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2¾d. per ft. delivered.
„ fourths	2d. „ „
21 oz. thirds	3¼d. „ „
„ fourths	3d. „ „
26 oz. thirds	4¼d. „ „
„ fourths	3¾d. „ „
32 oz. thirds	5¾d. „ „
„ fourths	5d. „ „
Fluted Sheet, 15 oz.	3¼d. „ „
„ 21 oz.	4¼d. „ „
⅛ Hartley's Rolled Plate	2d. „ „
¼ „ „ „	2¼d. „ „
⅜ „ „ „	2½d. „ „
Figured and Oxford Rolled Oceanic white	4d. „ „
„ „ „ tinted	5¼d. „ „

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	9
„ „ „ in barrels	„	0	1	10
„ „ „ in drums	„	0	2	0
Boiled „ „ in pipes	„	0	1	11
„ „ „ in barrels	„	0	2	0
„ „ „ in drums	„	0	2	2
Turpentine in barrels	„	0	3	11
„ in drums	„	0	4	1
Genuine Ground English White Lead	per ton	22	10	0
Red Lead, Dry	„	21	10	0
Best Linseed Oil Putty	per cwt.	0	6	6
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

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TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BOUGHTON MONCHELSEA (Kent).—For an enlargement of the Council school, for the Kent Education Committee. Messrs. Ruck & Smith, architects, 86, Week-street, Maidstone:—

Jefferys	£644 0	Langridge	£488 0
G. Pearse & Sons	598 0	R. Avards	483 0
H. J. Smith & Sons	580 0	Elmore	429 0
Ellingham & Sons	563 0	Corben	420 10
H. Goodwin	525 0	J. Wood & Sons, Boughton Monchelsea‡	375 0
Simmonds	525 0		
Davison	520 0		
W. Blay	517 0		

‡ Recommended for acceptance.

CANTERBURY.—For Canterbury new post-office:—

	£	Cr.
Paramor & Sons	11,300	£12
Amos & Foad	10,990	50
W. H. Martin	10,750	227
G. Browning	10,736	260
W. J. Adcock	10,460	475
Sturry Building Co., Ltd.	10,348	190
G. H. Denne & Son	10,160	195
Newton White	10,057	200
W. Strange & Sons, Ltd.	9,943	223
Hayward & Paramor	9,900	336
W. H. Hyde	9,828	—
G. Barton	9,800	100
Rowland Bros.	9,733	534
Gann & Co., Ltd.	9,487	252
G. E. Wallis & Sons, Ltd.	9,474	314
J. Shelbourne & Co.*	9,190	260
W. K. Grigg	9,134	199

FULHAM.—For making-up the carriageway of Finlay-street, for the Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

	Roadway.	Footway.
Borough Surveyor	£1,868 3 11‡	—
A. B. Champniss	1,300 0 0	—
G. W. Wimpey & Co.	1,163 0 0	—
H. J. Greenham	1,155 0 0	—
J. Mears*	1,115 0 0	—
J. Mowlem & Co.	1,088 0 0	—

[Borough Surveyor's estimate for paving the footways is £403.*]

‡ This amount includes both roadway and footway.

HULL.—For alterations and additions to the violent and troublesome and attendants' blocks at the City Asylum, Willoughby, for the Asylum Committee of the Corporation. Mr. Joseph H. Hirst, City Architect, Town Hall, Hull:—

			Hebblewhite & Wilson	£14,485	10	0
Bowman & Sons	£16,100	0 0	E. Good & Sons, Ltd.	14,023	16	6
G. Houlton	15,948	0 0	G. H. Panton	14,000	0	0
G. Eckles	15,500	0 9	G. Jackson & Son	13,924	0	0
A. J. Darmley	15,258	16 6	H. Arnold & Son	13,757	0	0
T. Goates	15,239	0 0	J. H. Fenwick, Hull*	13,175	0	0
S. R. & T. Kelsey	15,203	0 0				
H. T. Arnott	15,197	4 10				

LEEK.—For erecting post-office:—

		Credit Old Materials.
J. Gallimore	£4,846	£40
J. Heath & Sons	4,530	15
Sampson Hall	4,475	30
T. Grace	4,325	100
C. Cornes & Son	4,245	20
J. & J. Warner	3,920	100
T. Godwin*	3,256	30

LONDON.—For refitting first-class swimming bath, Gt. Smith-street Baths, for the Westminster City Council:—

T. Pearce	£1,226	0 0	Hudson & Co.	£950	0 0
W. H. Hyde	1,157	0 0	Spiers & Son	940	0 0
Barnes & Co.	1,093	17 9	J. R. Sims	933	0 0
Burton Bros.	1,030	0 0	E. Jenner	794	0 0
T. W. Haylock	1,012	0 0	T. Coulthard	774	0 0
Fleming & Co.	1,004	0 0	Jones & Son*	718	0 0
Love & Co.	970	0 0			

LONDON.—For alterations, etc., to the public convenience at Parliament-street, S.W., for the Westminster City Council:—

J. Mowlem & Co., Ltd.	£433 0
Patman & Fotheringham*	317 3

LONDON.—For making-up roadway of Harbord-street, Fulham, for the Fulham Borough Council. Mr. F. Wood, Borough Surveyor, Town Hall, Fulham, S.W.:—

H. J. Greenham, Rosebank Wharf, Fulham* £994

LONDON.—For alterations and additions to the Grange, West Heath-road, Hampstead, N.W. Messrs. Inman & Sturdee, architects, 7, Bedford-row, W.C. Quantities by Messrs. Smyth & Dearle, 7, John-street, Adelphi, W.C.:—

Ryder & Son	£10,762	J. Smith & Sons	£9,289
Melbourne	10,397	W. King & Son	9,009
S. S. Scott	10,147	G. Godson & Son	8,967
J. Simpson	10,010	Miskin & Sons	8,960
J. Dorey, Ltd.	9,700	Holland & Hannen	8,888
Kilby & Gayford	9,483		

SHEFFIELD.—For erecting a residence in Graham-road. Mr. G. Malam Wilson, architect and surveyor, 37, Surrey-street, Sheffield. Quantities by the architect:—

J. H. S. Randall	£3,150	0 0	E. B. Dyson & Son	£1,871	16	0
Smith & Nunn	2,500	0 0	W. & A. Forsdyke & Johnson & Appleyard	1,869	4	0
T. Gray & Sons	2,216	0 0	E. & W. Oxley	1,867	0	0
Abbot & Bannister	2,175	0 0	C. Portass	1,866	0	0
D. Smith	2,003	0 0	B. Powell & Son	1,860	0	0
Badger & Appleby	1,957	0 0	C. Ward	1,815	12	7
H. Boot & Son	1,913	0 0	J. T. Robertson	1,800	0	0
J. Richerby	1,912	7 0	E. Moore	1,768	0	0
J. & H. Wheen	1,900	0 0	A. Bradbury‡	1,755	0	0
H. Kyme	1,899	0 0				

‡ Accepted subject to slight revision.

ST. ALBANS.—For new post-office, St. Albans:—

C. W. Dumpleton	£3,350	A. W. Nash	£2,852
D. Parkins & Co.	3,290	G. Wiggs	2,790
F. W. Stanley	3,205	F. Gough & Co.	2,784
E. Dunham	3,197	H. Salisbury & Son	2,780
J. T. Bushell	3,147	C. Miskin & Sons	2,780
Spreckley & Smith	3,035	Vail & Williamson	2,777
F. & G. Foster	2,989	E. Brown & Son*	2,650
W. H. Hyde	2,885		

SOUTHAMPTON.—For alterations and additions to Moira House, Above Bar. Messrs. Hair & Bucknill, architects, Southampton. Quantities by Mr. C. I. Hair:—

Lawrence	£1,300	Stevens & Co.	£1,193
Jenkins & Co.	1,295	J. Nichol	1,137
Long	1,260	Golding & Ansell	1,137
Dyer & Sons	1,200	Rylands Bros., Shirley	1,023
Bagshaw & Son	1,195		
Wright & Son	1,194		

STRANORLAR.—For building and completing new Presbyterian Church, Stranorlar, for the Committee of Stranorlar Presbyterian Church. Mr. John M'Intyre, architect, Letterkenny:—

Smith Bros.	£2,270	0	S. Donnell & Co. Strabane*	£1,498	10
J. M. Clay	1,896	0			
S. Woods	1,701	0			

SUTTON.—For new post-office, Sutton:—

W. Hopkins	£5,690	C. Ansell	£4,900
J. Longley & Co.	5,589	F. & G. Foster	4,870
H. C. Payne	5,446	F. J. Shopland	4,760
F. & E. Davey, Ltd.	5,260	W. Smith & Sons	4,748
J. Burges & Son	5,227	J. Appleby & Sons	4,736
Marriott & Salter	5,100	Braid, Pater, & Co., Ltd.	4,697
Martin, Wells, & Co., Ltd.	5,029	J. Shelbourne & Co.	4,614
Drowley & Co.	4,999	F. Gough & Co.	4,590
Cropley Bros. Ltd.	4,993	R. Jones & Son*	4,554
Gathercole Bros.	4,990	J. F. Holliday	4,373
E. P. Bulled & Co.	4,975	F. G. Lawrence	4,199
W. H. Hyde	4,968		

WALSALL.—For erecting new school for 336 senior boys and girls and manual training centre, Hillary-street, for the Education Committee. Messrs. Bailey & McConnal, architects, Bridge-street, Walsall:—

G. H. Marshall	£3,967	J. Dallow	£3,390
W. & J. Webb	3,690	J. Barnsley & Son	3,388
Smith & Son	3,685	H. J. Ham	3,360
W. Tapcote	3,666	T. Mason	3,345
G. Insley	3,638	J. Hall & Son	3,330
H. F. Wootton	3,625	G. Guest & Son	3,330
G. Webb	3,535	T. Hardy	3,295
E. Mallin	3,520	T. Tildesley	3,294
H. Willcock & Co.	3,507	G. E. Jackson	3,250
W. Wistance	3,498	Brockhurst & Wood	3,250
F. Lindsay Jones	3,420	H. Gough & Son	3,200
T. Herbert	3,400	T. Wootton, Bloxwich*	3,063
W. Kendrich	3,390		

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